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# A GUIDE TO UNDERSTANDING CANADA

by  
James Peters

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TORONTO, CANADA

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PREFACE

This textbook, as the title suggests, is intended to guide students in understanding the geography of Canada through their own discoveries.

The problems in this book are designed to motivate the student to discover through research. Although most of the problems can be answered from information presented on the maps, graphs, and illustrations, some require other source materials such as globes, atlases, and other books, thus developing student research skills and encouraging classroom discussions.

The material has been carefully graduated from simple to difficult which allows all pupils to answer most questions. A special skill-building chapter on map reading is included to help students acquire and utilize the basic skills needed for a broad understanding of maps. It is not intended that all the problems be answered in one year. Only those questions which will develop pertinent generalizations should be studied. In some cases the teacher or student may wish to prepare special problems for investigation. Canada is studied through a regional approach allowing for the investigation of various phenomena in a common setting. Utilizing generalizations gained in one region, the student is guided to apply them to another region. Combining the knowledge of the similarities and differences discovered about various places throughout the nation, the student emerges with a basic understanding of Canada.

It is hoped that by using this unique textbook, geography will become real and exciting for the children as they discover for themselves—Canada.

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## OVERVIEW OF CANADA



Map 1

## LOCATION, SHAPE, AND SIZE

### FROM A MAP

**A.** One degree of latitude is approximately 69 miles on the earth's surface.

1. What is the latitude of the most southern, and the most northern, point in Canada?

(a) Estimate the distance, in miles, between these two points.

**B.** The 49th Parallel forms much of the United States – Canadian border, and also passes through other parts of Canada. The distance around the world along this Parallel is about 16,500 miles.

1. Using a pair of dividers, calculate in miles, Canada's extent along the 49th Parallel.

(a) Express Canada's extent as a fraction of the total distance around the world.

2. If you could travel across Canada along the 49th Parallel:

(a) How many hours would it take by automobile at an average speed of 50 miles an hour?

(b) How many hours would it take to fly the same distance by jet airplane at 400 miles an hour?

3. What is the longitude of the most western, and the most eastern, point of Canada?

(a) Using the scale of miles, calculate the distance between these points.





Map 2

### Air Routes from Canadian Centres

b) Calculate the distance, in miles, between St. John's and London, England.

c) Compare the distances found in (a) and (b) above.

### FROM A GLOBE

1. Estimate and compare the mileages from: (a) Montreal to Calais, France; (b) Halifax to Liverpool, England; (c) Vancouver to Sydney, Australia; and (d) Vancouver to Tokyo, Japan.

2. Give the direction, and distance in miles, of the shortest route from Edmonton to Moscow, Russia.

3. With the aid of a string and a scale of miles, calculate the distance between Edmonton and Moscow: (a) in an eastward direction from Edmonton, and (b) in a westward direction from Edmonton.

7. Find the shortest distance between Dawson and Oslo, Norway.

8. Define the term Great Circle Route.

9. What effect has distance upon Canadian ties with Europe and Asia?

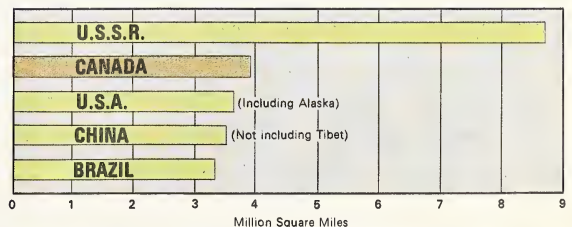


Figure 1 – Canada's Area Compared with those of the World's Five Largest Countries.

### C. Large land masses surround the Arctic Ocean.

1. In what strategic way does Canada separate the world's two greatest powers, the United States and Russia?
2. Calculate the mileage between Canada and Russia at the closest point.
3. Locate, name, and mark the following on an outline map of Canada: (a) three oceans, (b) five bays, (c) four straits, (d) two gulfs, and (e) one sea.

## GLACIATION

During different glacial periods, ice sheets up to 10,000 feet thick covered much of North America and greatly changed its surface.

1. At what three centres did the ice sheet originate?
2. How far south did the ice sheet advance?



Figure 2 — Glaciation

3. Account for the irregular south limits of the ice sheet
4. What part of Canada was not covered by ice? Why?



Map 3





Name some effects of glaciation in your own area.

Where can glaciers still be seen today?

## BUILD

Map 3 presents a simplified picture of Canada's physical development through the ages.

How much of Canada is occupied by the Canadian Shield?

Of what kind of rock is the Shield composed?

How does the age of this rock in the Shield compare with that in other parts of Canada?

Explain:

(a) what is meant by sedimentary layers.

(b) how folded mountains are formed. Draw diagrams showing their development.

(c) how land masses are being elevated.

## DRAINAGE BASINS

Map 4

**A. Four important river systems are:** (a) The St. Lawrence, (b) The Saskatchewan-Nelson, (c) The Mackenzie, and (d) The Fraser.

1. Into what body of water does each of these systems drain?

2. Using a scale of miles and a pair of dividers, compare the length of each river system with that of the others.

3. Why are the names of the drainage basins on Map 4 appropriate?

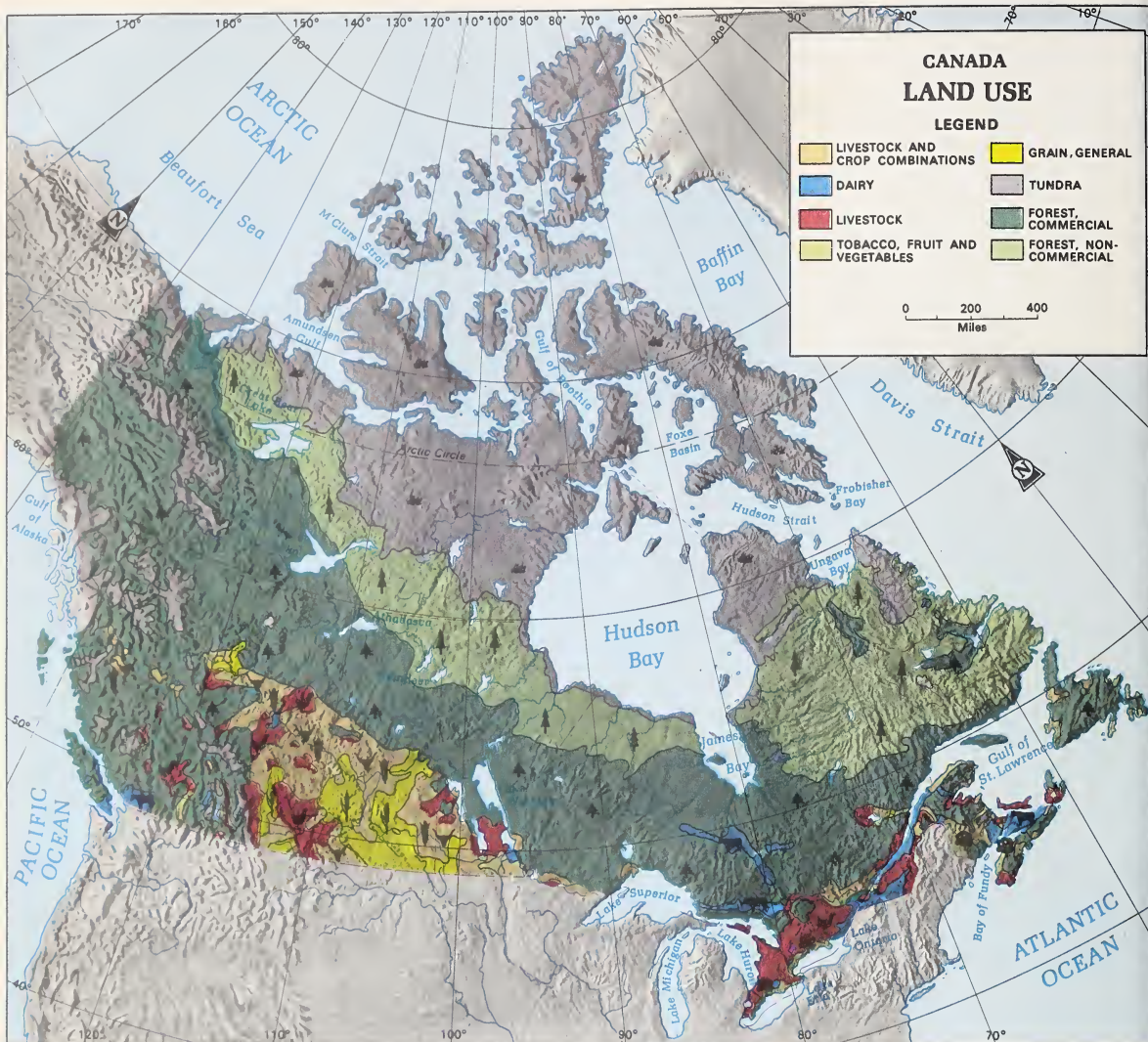
**B. Nearly half the fresh water of the world lies within Canada's boundaries.**

1. Why is fresh water a valuable resource?

2. What large Canadian rivers are fed by glaciers?

3. Give other major sources of water for rivers.





Map 5

## LAND USE

**A. Only a small proportion of Canada is devoted to farming and livestock.**

1. Name three areas of intensive farming.
2. What two main types of farming are found in the Prairie Provinces?
3. Why is dairying usually carried on close to populated areas?
4. Name three areas of specialized farming in the Maritimes.
5. Compare the Soils map with the Land Use map. Which soils are suitable for agriculture? Why?





Map 6

**B. Podzol and chernozem are words used to describe soils.**

1. Define these terms.
2. Besides soil, name two other important factors that affect agriculture.
3. Name the special crops grown in the following areas:  
(i) Niagara Peninsula, (ii) Annapolis Valley, (iii) Okanagan Valley, (iv) Montreal area, (v) Delhi area in Ontario, (vi) Fraser River delta, and (vii) Lake St. John area.

(a) What are the chief factors that make these products possible in these particular areas?





**Mixed Forest in the Shield.** Why is this timber not profitable to cut?



**Commercial Forest in the Shield.** For what purpose are these trees being cut?

**C. Much of the Canadian Shield consists of rocky terrain, swiftly flowing rivers, and ragged conifers.**

1. Name the most important product of the forest industry in the Shield.
2. How does "controlled" or "selective cutting" benefit the forest industry?
3. What major hazard threatens the forest industry during the summer months?
4. Suggest steps that are taken to avert this problem.



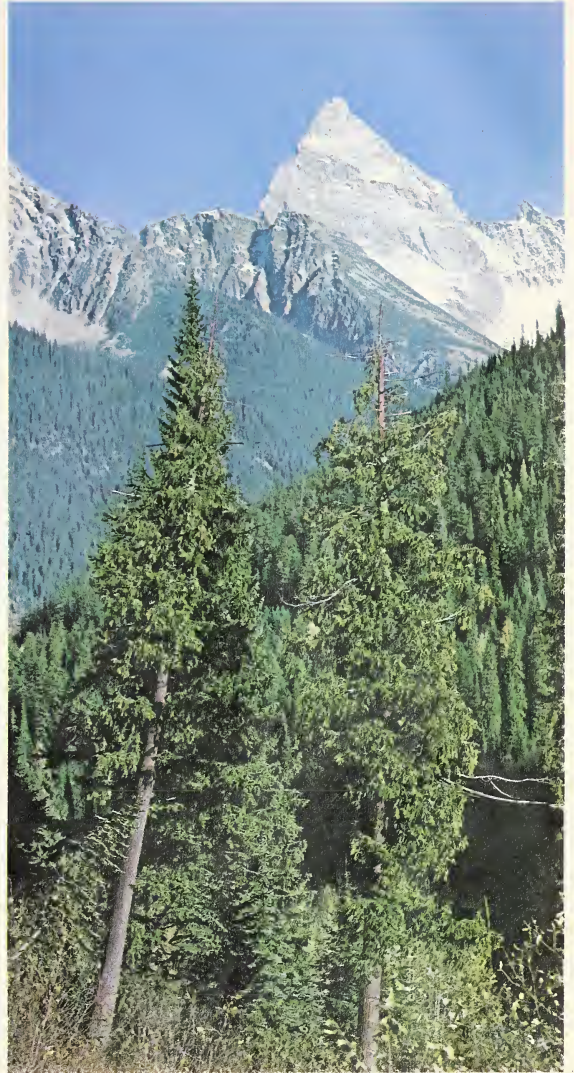
**A large part of Canada is covered by forests.**

Suggest a probable use for the trees in the photograph.

Compare lumbering operations in the Cordillera with those in more level country.

Locate the timberline.

Account for the lack of vegetation above the timberline.



**Commercial Forest in the Cordillera.** Suggest a probable location of this forest.

**Much of Canada's northlands consists of Tundra.**

At what time of year was this photograph taken?

Describe Tundra as seen during this season.

Account for the location of Tundra.

What is the probable economic future of this area? Give reasons for your answer.



**Tundra.** Account for the lack of vegetation.





Map 7

## PRECIPITATION

A. When water evaporates, it takes a form known as water vapour. The warmer the air, the more water vapour it can hold. Water vapour, when cooled, condenses into clouds, which can give rain or snow.

1. Explain the water cycle as shown in Figure 5.
2. Account for the less luxuriant vegetation on the lee-side of the mountains.
3. Define the term "rain shadow".

B. Air masses affect climatic conditions. Winds take on the climatic characteristics of the area over which they pass.

1. Name three air masses that affect Canada and describe their probable temperature and moisture content.

2. Examine the winds and landforms shown in Figure 6. Give reasons why the southerlies veer eastward along the St. Lawrence River valley.

3. With reference to Map 7, explain why the west coast of British Columbia receives so much precipitation, and why Alberta and Saskatchewan receive so little.

4. What winds bring precipitation to the eastern part of Canada?

5. Account for the small amount of precipitation in northern Canada.



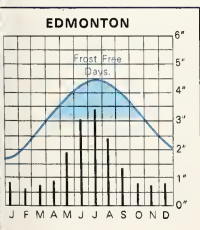


Figure 3 — Some Air Masses that Affect North America.

C. The graph shows the amount of precipitation at Edmonton for each month over the period of a year.

1. What is the total annual precipitation?

2. During what season of the year is there most precipitation?

Figure 4  
Climatic Graph

Examine a precipitation chart of your own community. Which season is the wettest? Which is the driest?

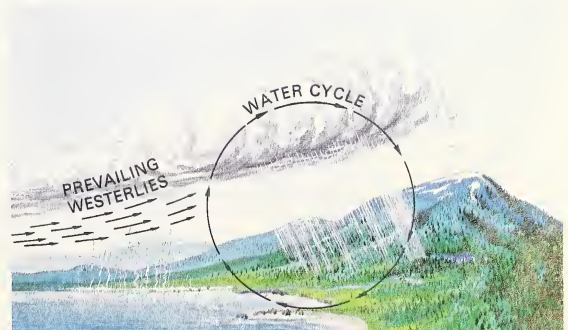
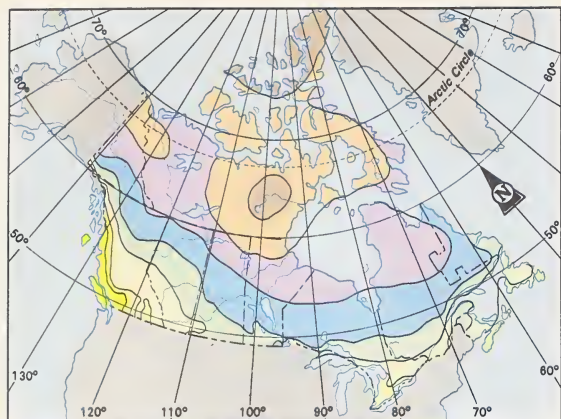


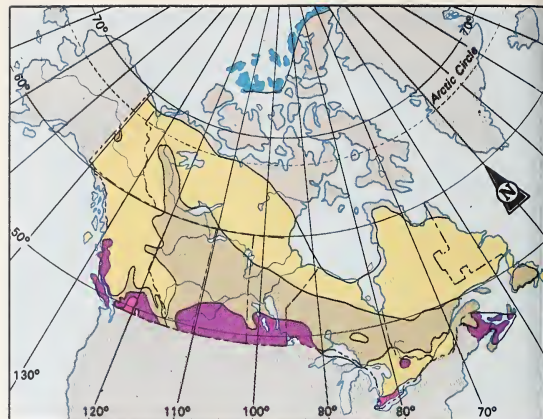
Figure 5 — Precipitation on the West Coast.



Map 8

|            |      |      |    |     |     |     |      |
|------------|------|------|----|-----|-----|-----|------|
| BELOW -30° | -20° | -10° | 0° | 10° | 20° | 30° | OVER |
|------------|------|------|----|-----|-----|-----|------|

Average January Temperatures (°F.).



Map 9

|           |     |     |     |     |      |
|-----------|-----|-----|-----|-----|------|
| BELOW 40° | 50° | 60° | 65° | 70° | OVER |
|-----------|-----|-----|-----|-----|------|

Average July Temperatures (°F.).

## TEMPERATURE AND CLIMATE

Three factors that influence temperatures are: (a) latitude, (b) altitude, and (c) nearness to large bodies of water.

### MAP 8

A. As one moves northward along the Saskatchewan-Manitoba border, there is a steady decrease in temperature.

Which of the three factors named above causes this?

B. Inuvik is much farther north than Fort Smith, yet the average January temperatures are similar for both places.

1. Account for this.

2. Account for the difference in temperature at Trail and Vancouver, although both are located close to the 49th Parallel.

3. What is the effect of large bodies of water on winter temperatures?

4. Why is the temperature on the west coast generally higher than that on the east coast?

5. Account for the high winter temperatures at: (a) John's, (b) Windsor, and (c) Prince Rupert.

### MAP 9

6. What is the effect of large bodies of water on summer temperatures?

7. In what two provinces is the highest average July temperature found? Account for this.

8. Explain the low temperatures found in: (a) most British Columbia, and (b) across the Northland.

C. To obtain the temperature range of an area, subtract its lowest temperature from its highest temperature.

1. What is the temperature range of the following centres: (a) those near large bodies of water: Victoria, Halifax, Toronto, and Inuvik, and (b) those away from large bodies of water: Winnipeg, Calgary, and Peace River?

2. Make a generalization regarding temperature range as a function of distance from large bodies of water.

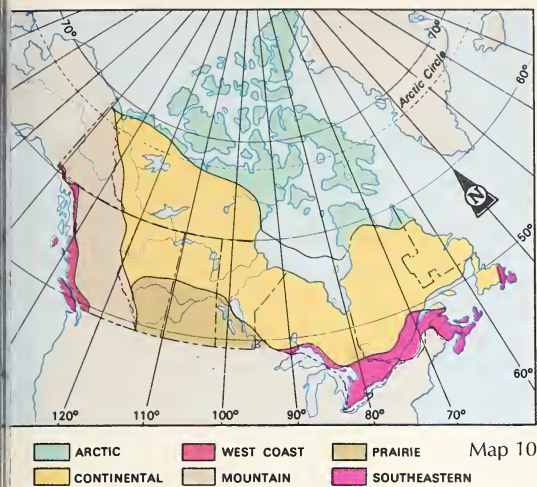
### FIGURE 6

D. The annual temperature of an area can be shown on a graph.

1. Which month is the warmest? Which is the coldest?

2. What are the two extremes in temperature?





Climatic Regions

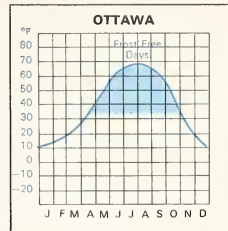


Figure 6  
Average Annual  
Temperature

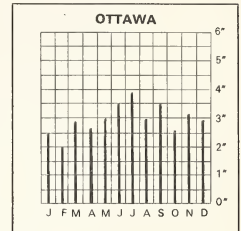


Figure 7  
Average Annual  
Precipitation

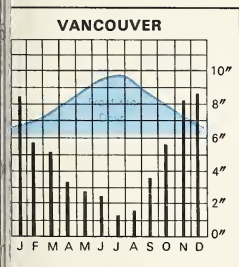


Figure 8

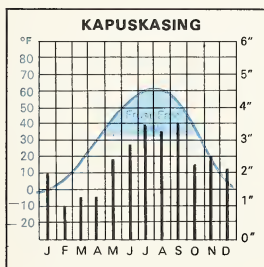


Figure 9

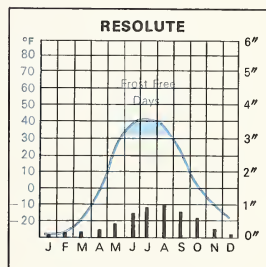


Figure 10

What is the temperature range?

## URE 7

During which season of the year is there most precipitation?

Which is the wettest month? Which is the driest?

Three types of climate found in Canada are West Coast, Continental, and Arctic. Examples of each type are found at Vancouver, Kapuskasing, and Resolute, respectively.

Make a copy of the following table and complete the blanks, using information from the appropriate climatic data.

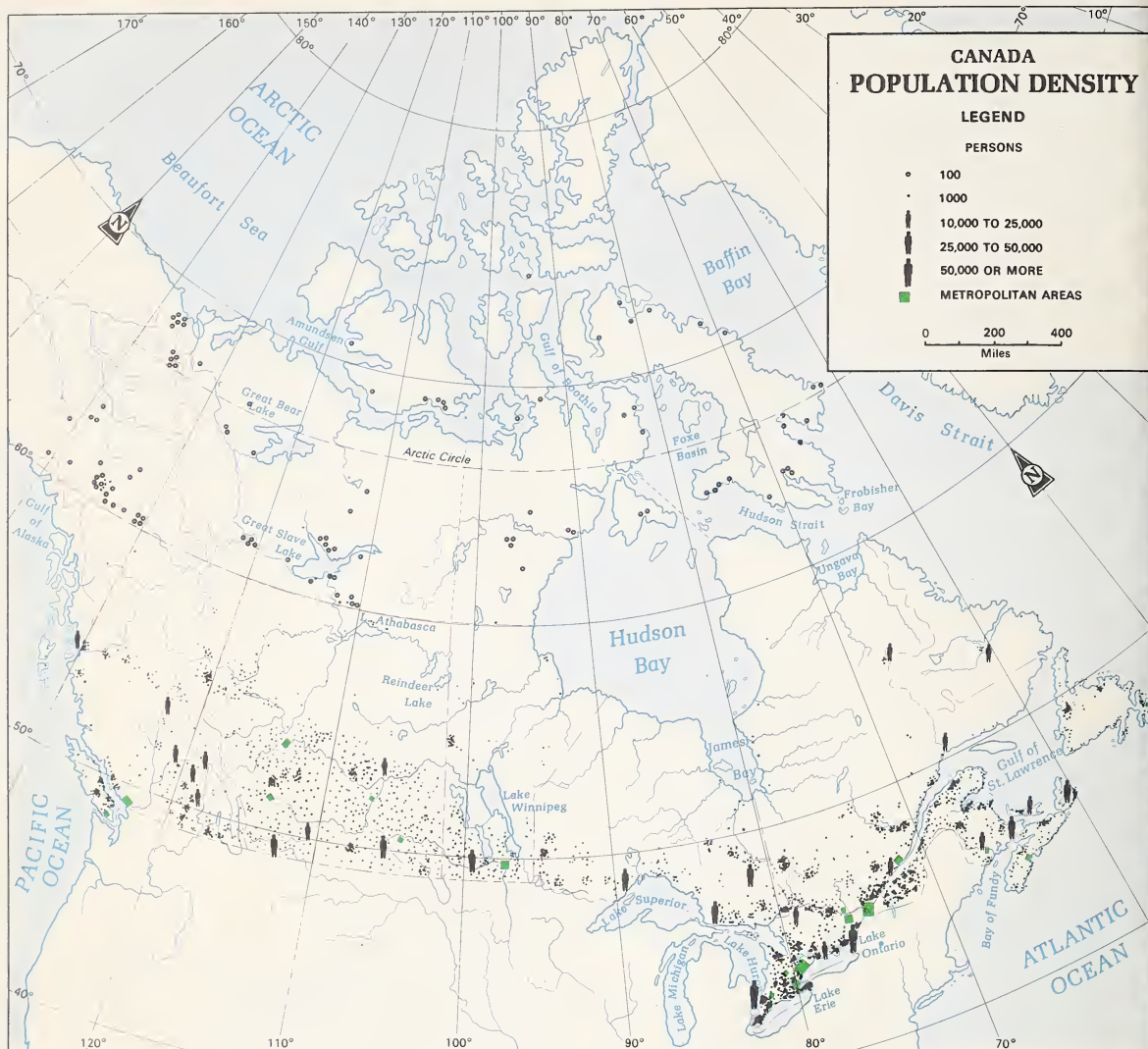
| CLIMATE     | AVERAGE JANUARY TEMP. | AVERAGE JULY TEMP. | TEMP. RANGE | ANNUAL PRECIPITATION |
|-------------|-----------------------|--------------------|-------------|----------------------|
| West Coast  |                       |                    |             |                      |
| Continental |                       |                    |             |                      |
| Arctic      |                       |                    |             |                      |

- Which type of climate has the:
  - greatest amount of precipitation?
  - least amount of precipitation?
  - greatest temperature range?
  - smallest temperature range?
  - conditions you like best? Why do you prefer this climate?

3. Listed below is information about the climate of five areas. Tell whether the climate is West Coast, Continental, or Arctic.

|     | AVERAGE JANUARY TEMPERATURE | AVERAGE JULY TEMPERATURE | AVERAGE PRECIPITATION |
|-----|-----------------------------|--------------------------|-----------------------|
| (a) | 34°F.                       | 66°F.                    | 73"                   |
| (b) | -35°F.                      | 42°F.                    | 2"                    |
| (c) | 0°F.                        | 60°F.                    | 17"                   |
| (d) | -10°F.                      | 55°F.                    | 28"                   |
| (e) | 22°F.                       | 60°F.                    | 54"                   |

4. In which climatic region do you live?



Map 11

## POPULATION

**A. Canada's total population is over 20,000,000.**

1. In what parts of the provinces do most Canadians live?
2. Make statements concerning the spread of population with respect to: (a) Canada generally, (b) the United States-Canadian border, and (c) rivers, lakes, and farmland.
3. Locate the areas of large concentrations and give reasons why people live in these areas.
4. Which province of Canada has the largest population? (a) What proportion of the total population is this?

**B. In the Atlantic Provinces, most of the people live along the coast.**

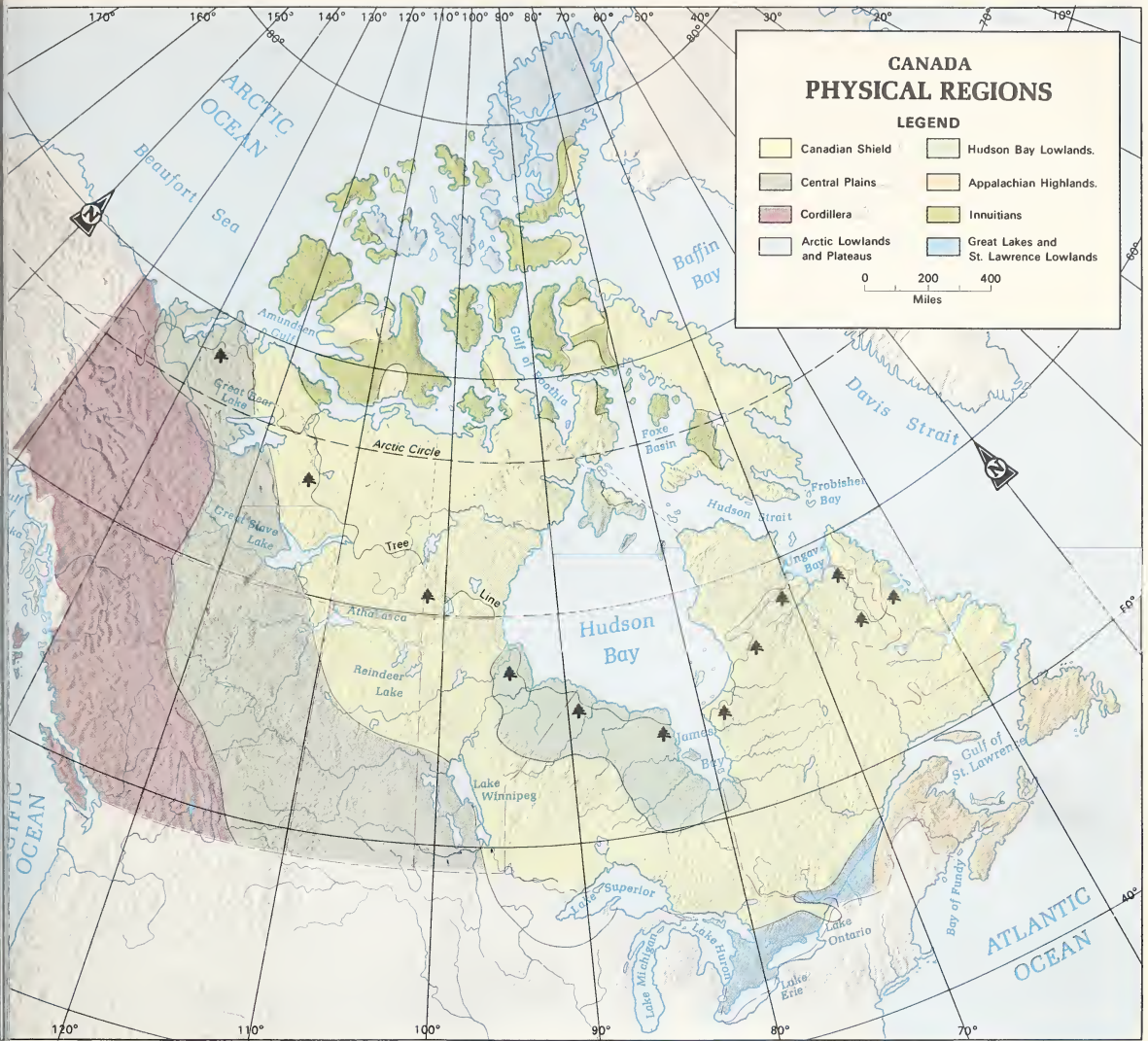
1. Give at least two reasons to explain why this is so.
2. Where in British Columbia, other than in the coastal areas, are there concentrations of people? Explain why.

## PHYSICAL FEATURES

**A. The variety of picturesque landscapes and the differences between one part of Canada and another are the result of a country consisting of eight distinct physical regions.**

1. Which Region makes up nearly half the total area of Canada?
2. Through which Provinces and Territories does Region extend?
3. Name two physical Regions common to Manitoba, Ontario, and Quebec.





Map 12



Figure 11 — Profile of Canada along the 49th Parallel

Canada's physical Regions were depicted on the backs of a series of dollar bills.

Describe and identify the Regions found on the backs of

- one-dollar bills.
- two-dollar bills.
- five-dollar bills.
- ten-dollar bills.
- twenty-dollar bills.

2. How many miles is it by plane along the 49th Parallel, from Gander to Victoria?

(a) What large body of water lies approximately midway between these two points?

3. On a profile similar to Figure 11 and with the aid of Map 12, draw neat vertical lines dividing the following regions: Cordillera, Central Plains, Canadian Shield, Appalachian.

(a) Label the Regions.

(b) Label the bodies of water shown on the profile you have drawn.

4. Sketch a large-scale profile map at the 49th Parallel of the:

(a) Cordillera Region. Label the following features: Insular Mountains, Coastal Trench, Coast-Cascade Mountains, and Eastern Foothills.

(b) Central Plains Region. Label the following features: Alberta Plain, Missouri Coteau, Saskatchewan Plain, Manitoba Escarpment, and Manitoba Lowlands.

## TIME ZONES

The adoption of standard time throughout most of the world led to the establishment of time zones. Theoretically, each time zone covers 15 degrees of longitude.

1. Calculate the number of time zones around the world.

2. Explain the need for universal time zones.

3. Why was an interval of 15 degrees selected for time zones?

4. On a political outline map of Canada, mark where you think the divisions between the time zones might be.

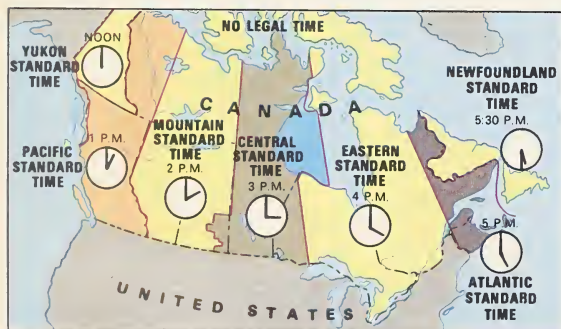
(a) Compare your map with Map 13, and explain any difference between the two maps.

5. How many time zones are there across Canada?

6. What is unique about Newfoundland Standard Time?

7. In which area of Canada is daylight seen first? seen last?

8. When it is 2.00 p.m. in Toronto what time is it in (a) Vancouver (b) Halifax (c) Yellowknife, and (d) St. John's?



Map 13

Time Zones of Canada

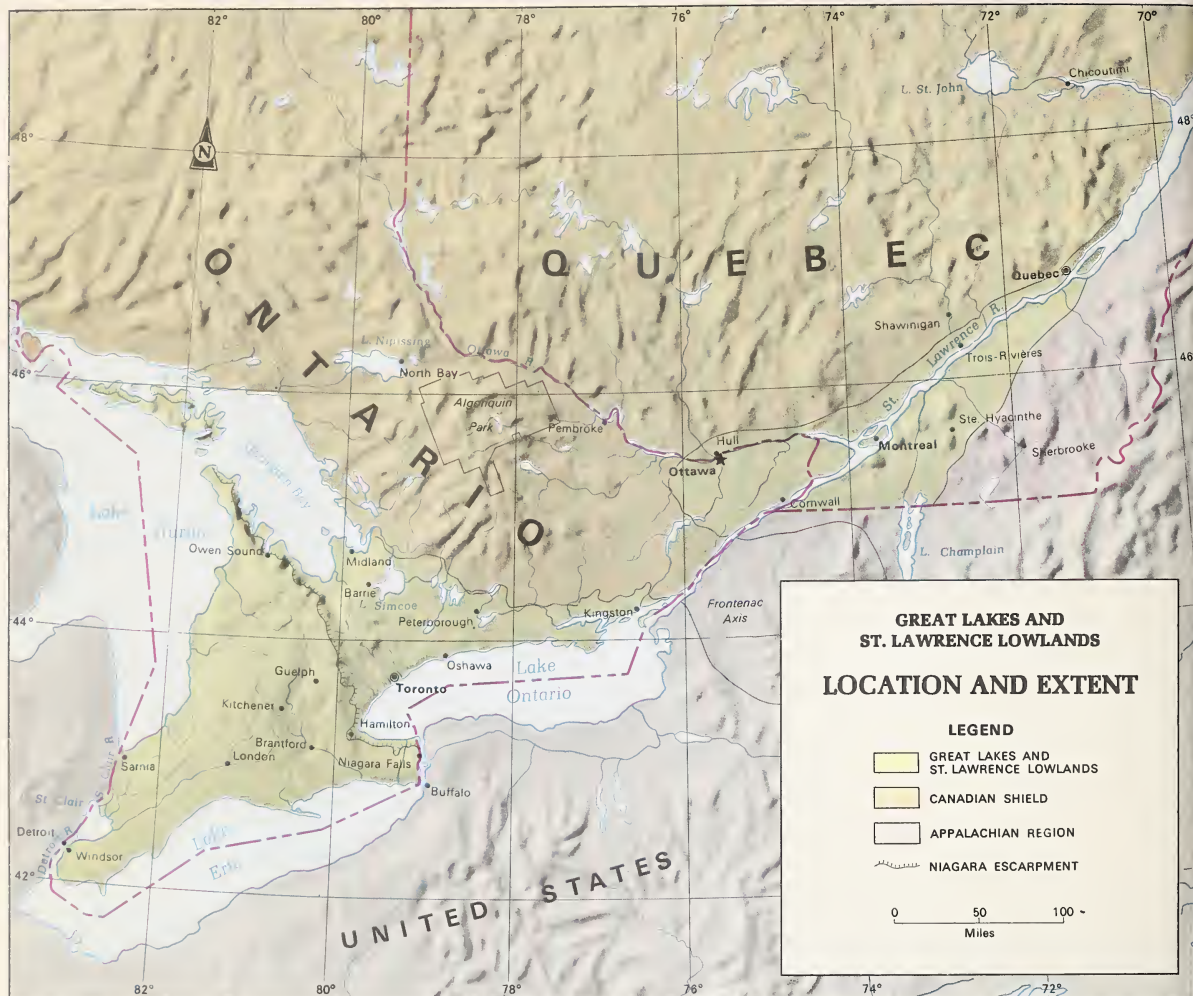


Figure 12 — Time and Rotation





THE GREAT LAKES  
AND  
ST. LAWRENCE LOWLANDS  
REGION



Map 14

## LOCATION AND EXTENT

**A. The Great Lakes and St. Lawrence Lowlands Region makes up about two percent of Canada's total area.**

1. What three physical Regions are shown on the map?
2. Name the two provinces that contain the Great Lakes and St. Lawrence Lowlands Region.
3. Name the Great Lakes that border the Lowlands Region.
4. Give the position, in degrees of latitude, of the most northern, and most southern, point of the Lowlands.
  - (a) What is the distance, in degrees of latitude, between these points?
  - (b) What is the distance in miles between them?

5. What meridian of longitude passes through the Region's most eastern, and most western, point?

(a) Using the scale of miles, calculate the distance between these meridians.

**B. The Niagara Escarpment was formed by differential erosion.**

1. Locate the Escarpment on the map.
2. What happens to the Niagara River as it crosses the Escarpment?
3. In what ways does the Escarpment benefit man?
  - (a) In what ways does it hinder him?
4. Name the large island bordering Georgian Bay that forms one end of the Niagara Escarpment?
5. How long is the Canadian part of the Escarpment?

1. The Lowlands are divided into two parts by an extension of the Canadian Shield.

What name is given to this part of the Shield?

a) Between what two cities does this extension pass?

b) How many miles is Quebec City farther north than Windsor?

3. Name the rivers shown on Map 14 that empty into the St. Lawrence River system.

(a) How are these rivers used to advantage?

(b) How do these rivers hinder man?

4. Why do you suppose geographers consider the Great Lakes Lowlands and the St. Lawrence Lowlands as one Region?

## GLACIATION

1. This Region was once covered by large sheets of ice hundreds of feet thick.

2. Make a sentence using each group of words to explain the effect of the ice on the land surface: (a) weight, depressed; (b) ice, water, floods; (c) floods, lower lands; (d) floods, lakes, deposit, level; (e) clay, sand, plains of good soil; and (f) higher lands, scraped.

3. Why did the Champlain Sea not extend beyond Deep River?



AREA COVERED BY GLACIAL LAKES AREA COVERED BY CHAMPLAIN SEA

Map 15—Glaciation and Water

## FORESTS

1. When the first Europeans came, a large part of this area was covered by dense forests and woodlands.

2. Define the terms deciduous and coniferous and give four examples of each.

3. The quality of soil partly determines the species of tree that will grow in an area.

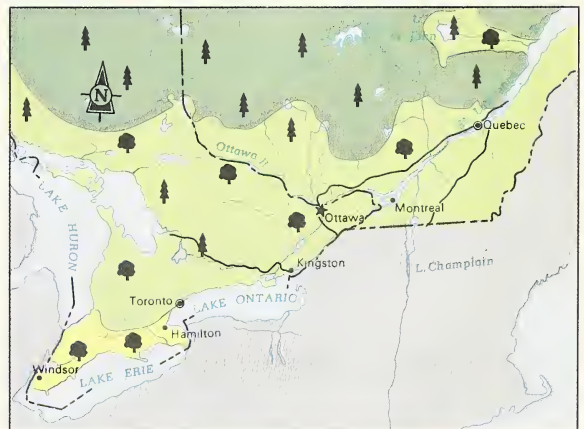
4. Name two additional factors.

5. Match the tree species listed in column B with a type of forest listed in column A.

| A                         | B  |
|---------------------------|--|
| Adirondack Forest         | —deciduous and some conifers; maple, oak, walnut, ash, hickory, hemlock, white pine. |
| Central Ontario Forest    | —mostly conifers, some deciduous; spruce, fir, tamarack, jackpine, poplar, birch.    |
| Upper St. Lawrence Forest | —deciduous only; maple, oak, walnut, beech, elm, basswood, ash, hickory.             |
| Evergreen Forest          | —mixed forest; half deciduous, half coniferous.                                      |

6. How were the forests a hindrance to the first settlers?

7. List five ways in which wood is commercially useful today.



DECIDUOUS FOREST GREAT LAKES AND ST. LAWRENCE FOREST EVERGREEN FOREST

Map 16—Forest Areas



Figure 13—Trees Common to the Lowlands



## PHYSICAL FEATURES

**A. The Lowlands consists of undulating land accentuated by the Niagara Escarpment and the Monteregian Hills.**

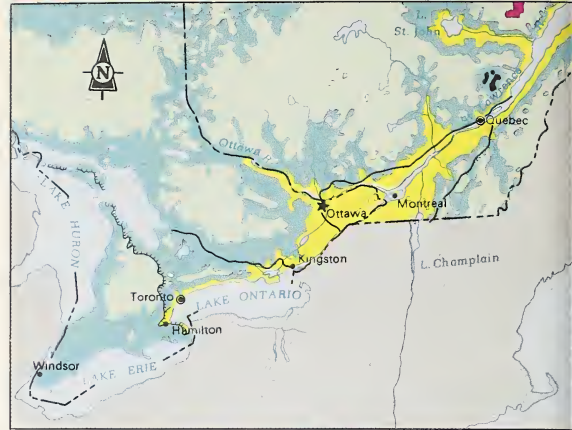
1. Name the bodies of water that border the western part of the Lowlands.
2. What name applies to the area that is nearly surrounded by water?
3. What natural formation separates central from western Ontario?

**B. One of the most picturesque landmarks in the Lowlands is located at Lat. 43°10'N., Long. 79°8'W.**

Identify this attraction.

**C. The Thousand Islands is typical of the land surface of the Frontenac Axis.**

1. To what larger region does this area belong?
2. What is the origin of the Monteregian Hills found in, and east of, Montreal?
3. Name the landform on which Montreal is situated.



Map 17 - Physical Features

4. Locate the rivers flowing into the St. Lawrence and give the directions of their flow.

(a) What landforms are responsible for the direction of flow?

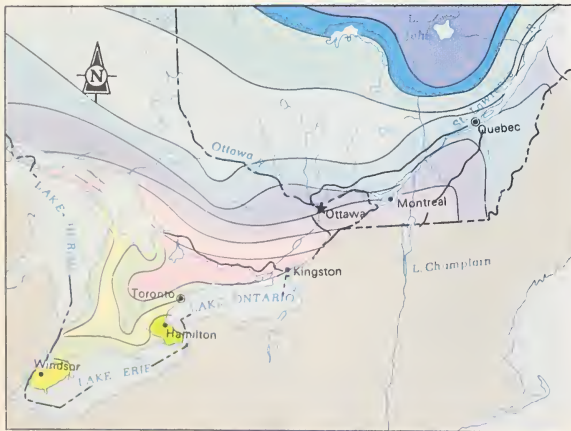
## TEMPERATURE

**A. Lines on a map joining places of equal temperatures are called isotherms.**

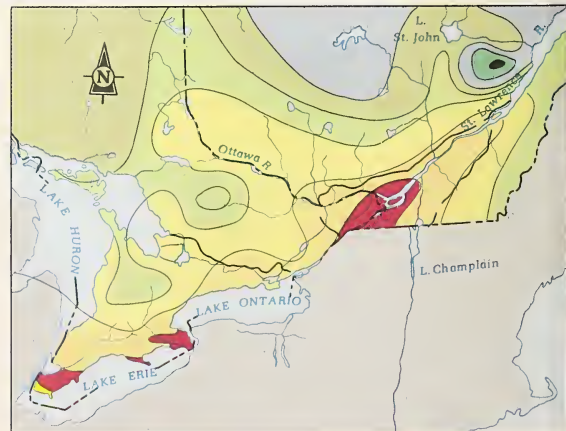
1. What colour is used between the 10°F. and 12°F. isotherms on the Average January Temperatures map?
2. What is the average January temperature of Windsor, and of Ottawa?
3. What is the average July temperature of Toronto, and of Montreal?

4. From a study of the area between the 20°F. and 22°F. isotherms, explain how large bodies of water affect winter temperature.

5. Study the area east of Georgian Bay between the 64°F. and 66°F. isotherms and the same area on the Physical Features map (No. 17) to explain:



Map 18 - Average January Temperatures (°F.)



Map 19 - Average July Temperatures (°F.)

a) why the temperature eastward, northward, and southward is higher, and (b) how the temperature of the area would be affected if the elevation were greater.

. Account for the fact that temperatures at Quebec City are lower than at Windsor, Ontario.

. From the climatic graphs, give the average temperature for: (a) Windsor in mid-April, (b) Montreal at the beginning of September, and (c) Quebec City at the end of November.

. Which are the warmest, and which are the coldest months for these three cities?

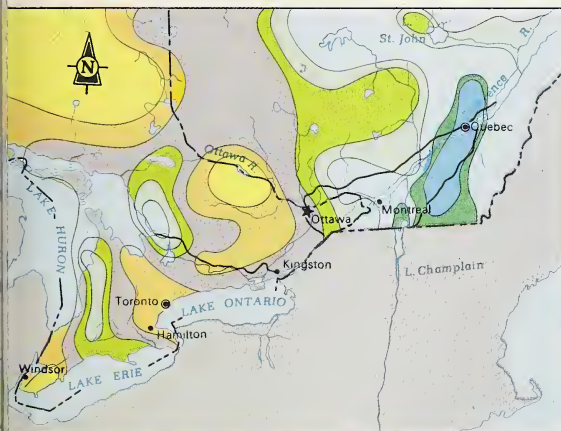
## PRECIPITATION

. Precipitation includes all forms of moisture deposited from the air.

. List five different forms of precipitation.

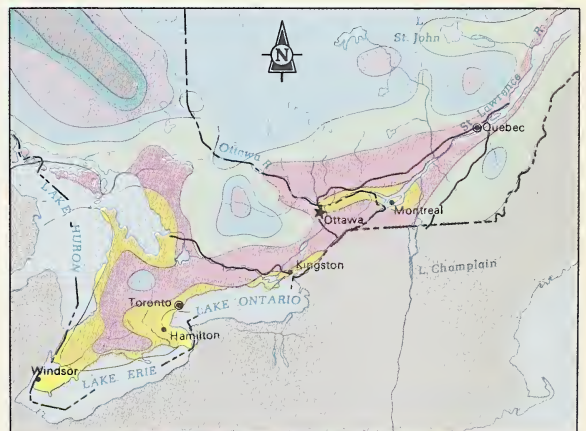
. What are the greatest and least amounts of precipitation (in inches) shown on the map?

. From a study of Map 17 and your knowledge of prevailing winds, account for the fact that there is greater precipitation just east of Lake Huron than just west of Lake Michigan.



BELOW 30" 32" 34" 36" 38" 40" 42" OVER

Map 20—Annual Precipitation



BELOW 40 60 80 100 120 140 160 OVER  
DAYS

Map 21—Frost-free Days

## CLIMATIC GRAPHS

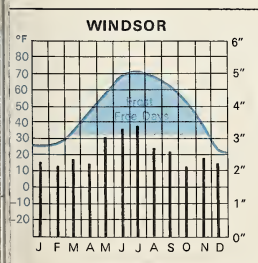


Figure 14

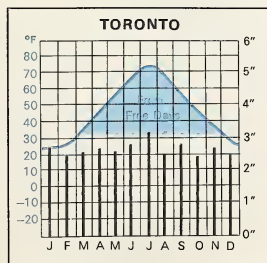


Figure 15

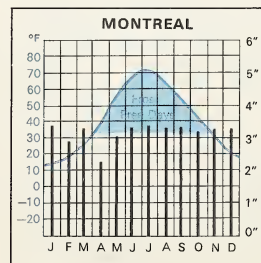


Figure 16

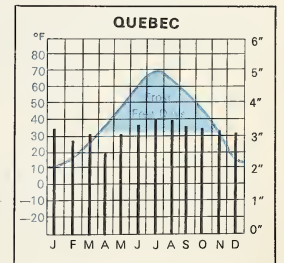


Figure 17

4. What effect do the high surfaces of the Canadian Shield and the Appalachians of Quebec have on winds moving eastward through the St. Lawrence Lowlands?

**B. The climatic graphs suggest that the amount of precipitation is fairly uniform throughout the year.**

Estimate the average monthly precipitation at Windsor, Toronto, Montreal, and Quebec City.

## FROST-FREE DAYS

**A. The number of frost-free days is calculated by counting the number of days between the last killing frost of spring and the first killing frost of autumn.**

1. Why would you expect Windsor to have a greater number of frost-free days than Quebec City?

2. How does the altitude of the Blue Mountains, near Georgian Bay, affect the number of frost-free days in that area?

3. About how many more frost-free days has Toronto than Montreal?

4. Explain the effect of the following on the number of frost-free days: (a) latitude, (b) nearness to large bodies of water, and (c) elevation.





Map 22

## DRAINAGE BASINS

A. The size of the drainage basin is usually relative to the length of the rivers it contains.

1. Define the following terms with reference to rivers: (a) source, (b) mouth, (c) delta, (d) estuary, (e) tributary, (f) master stream, (g) flow, and (h) divide.

2. Through what lakes, connecting rivers, and canals, does a freighter pass in travelling from Owen Sound to the Atlantic?

3. Suggest uses, other than transportation, of rivers and lakes.

4. List the main rivers whose source is in the western upland of the Great Lakes Lowland, and name the bodies of water into which these rivers empty.

5. What lakes are connected by the Trent Canal system?  
(a) Why was this system built?

(b) What type of boat uses this canal system now? Why?

6. What canal, built in 1832, links Montreal with Lake Ontario via the Ottawa River?

7. Name the canal that is used by ships sailing between Lake Ontario and Lake Erie.

8. What is the main tributary of the St. Lawrence River?

9. What river empties into the St. Lawrence estuary?

10. Name the rivers flowing into the St. Lawrence River from the south and locate their source.



Montreal Harbour

. The tributaries of the St. Lawrence that flow from the north are longer than the rivers of Ontario that flow into the Great Lakes.

With this in mind, and considering relief, compare the potential hydro-electric power of Ontario with that of Quebec.

## ST. LAWRENCE SEAWAY

. Montreal is one of the world's largest inland ports.

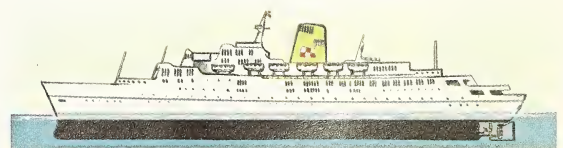
. Make a list of the principal imports and exports that enter and leave Montreal.

. What body of water is shown in the picture?

. How many miles up the St. Lawrence River is Montreal from Quebec City?

. Prior to the construction of the Seaway, ocean-going vessels unloaded their cargoes at Montreal even though these were intended for cities farther west.

What is the minimum depth of the Seaway?



Ocean Liner



Ocean Freighter



Great Lakes Freighter

Figure 18 — Ships that sail into Montreal Harbour



**C. An ocean freighter passes through the St. Lawrence River from Montreal headed for Port Arthur.**

1. Upon leaving the first lock, how many feet above sea level is the ship?
2. Through how many locks has the ship passed by the time it reaches the Iroquois Lock? By how many feet has it been raised?
3. Explain how and why the towns between Cornwall and Prescott were flooded during the construction of the Seaway.

**D. The ship now enters the Thousand Islands.**

1. To what physical Region do these islands belong?
2. What is the name of the first Canadian Great Lakes port on this route?
3. Name the busiest port on Lake Ontario.

**E. Between Lake Ontario and Lake Erie lies the greatest barrier to navigation of the Seaway.**

1. Name this obstacle and the canal that bypasses it.
  - (a) How many locks are there in this canal?
  - (b) What is the increase in elevation, in feet, as the ship is raised from one lake level to the other?
2. Why is the ship able to sail from Lake Erie (572 feet above sea level) into Lake Huron (580 feet above sea level) without the use of locks?
3. Name the final lock used on this westward voyage.
  - (a) Where is it located, and what lakes does it join?
4. Name the twin cities reached at the end of the trip.
5. By how many feet has the ship been lifted between Montreal and Port Arthur?
  - (a) How far has the ship travelled between these two cities?
6. Use Figure 19 to explain how a lock lifts and lowers a vessel from one level to another.

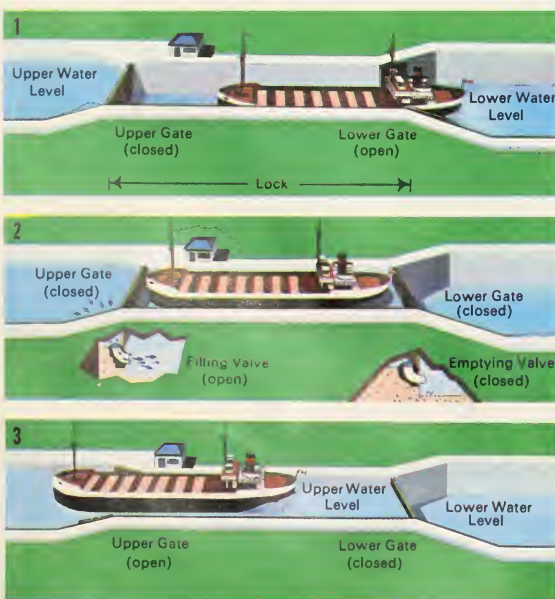
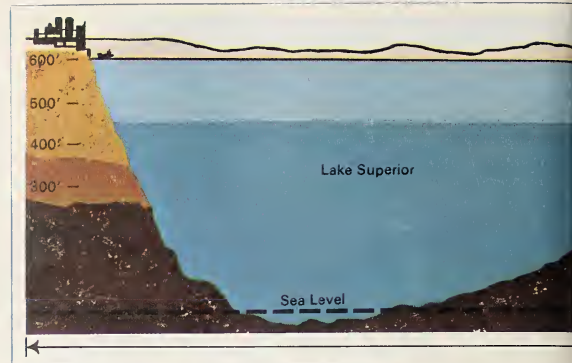
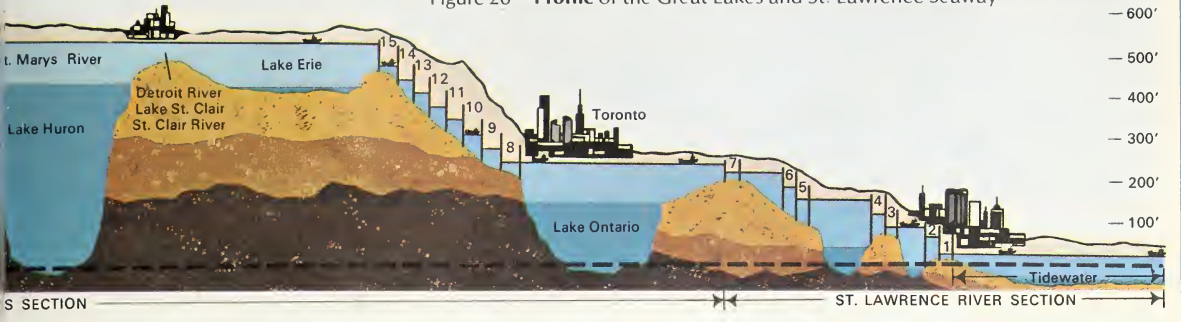


Figure 19 – Lock Operation

Map 23

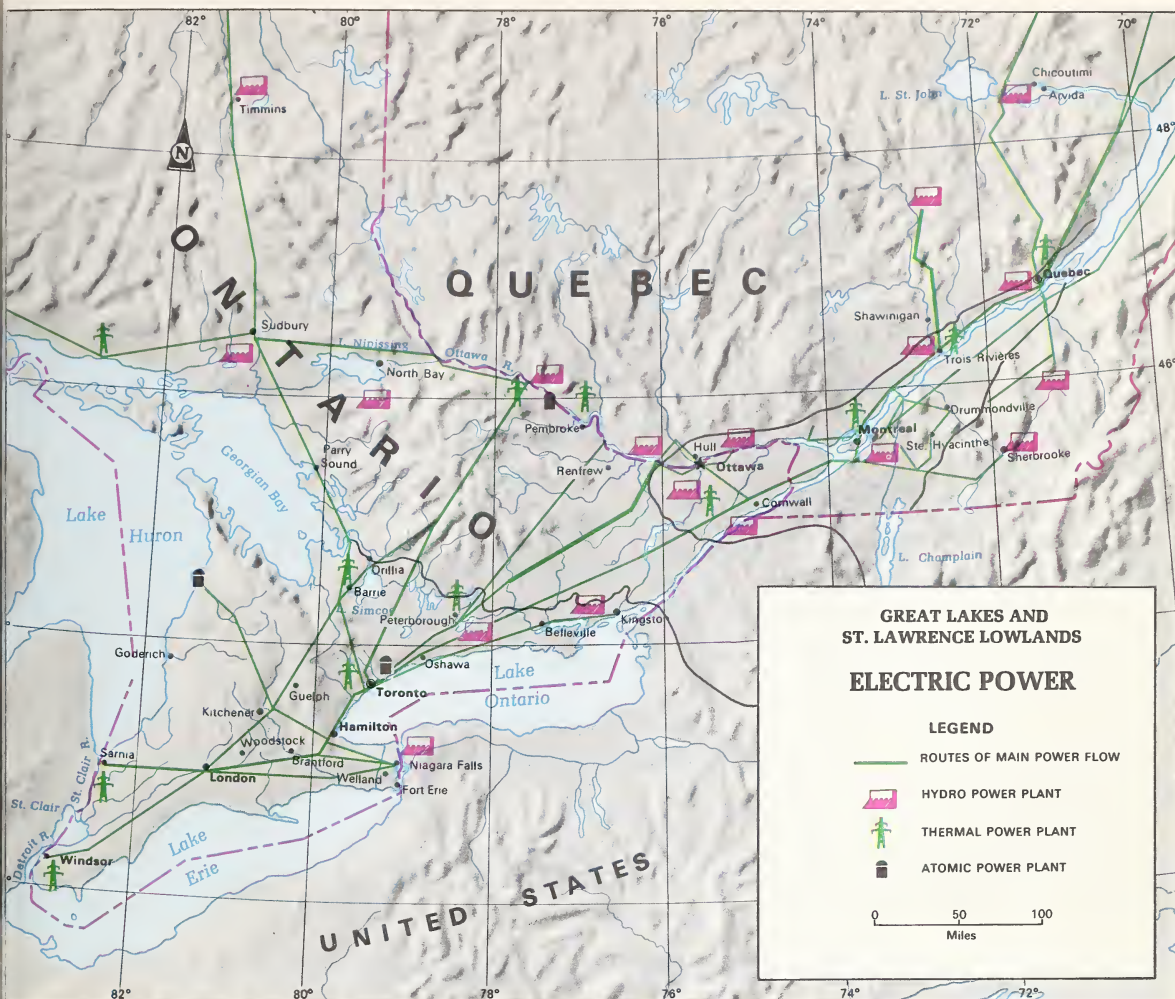
Figure 20 – Profile of the Great Lakes and St. Lawrence Seaway







**Welland Canal.** Compare the ships in the locks with those shown in Figure 19.



Map 24

## ELECTRIC POWER

**The availability of low-cost hydro-electricity helped make the Lowlands one of Canada's most important industrial and manufacturing areas.**

What characteristics are essential in a river to make it useful for hydro-electric development?

Account for the lack of hydro power plants in the central part of southwestern Ontario.

What areas produce hydro-electric power for (a) the Toronto area and (b) the Montreal area?

Why have thermal and nuclear power plants been constructed in the Toronto area?

5. Explain the effect of low-cost electric power on the industrial and population growth of this Region.

6. Note the large reservoir in the photograph (top of page 28). Where is its source of water?

(a) Why is it necessary for a hydro-electric generating plant to have a large reservoir nearby?

(b) From the photo describe how water from the reservoir reaches the generating station.

7. What basic differences are evident between the hydro-electric plant and the other two?

8. What similarities exist between the thermal and the nuclear power plants.





Hydro-electric Generating Station at Niagara Falls



Thermal Generating Station near Toronto

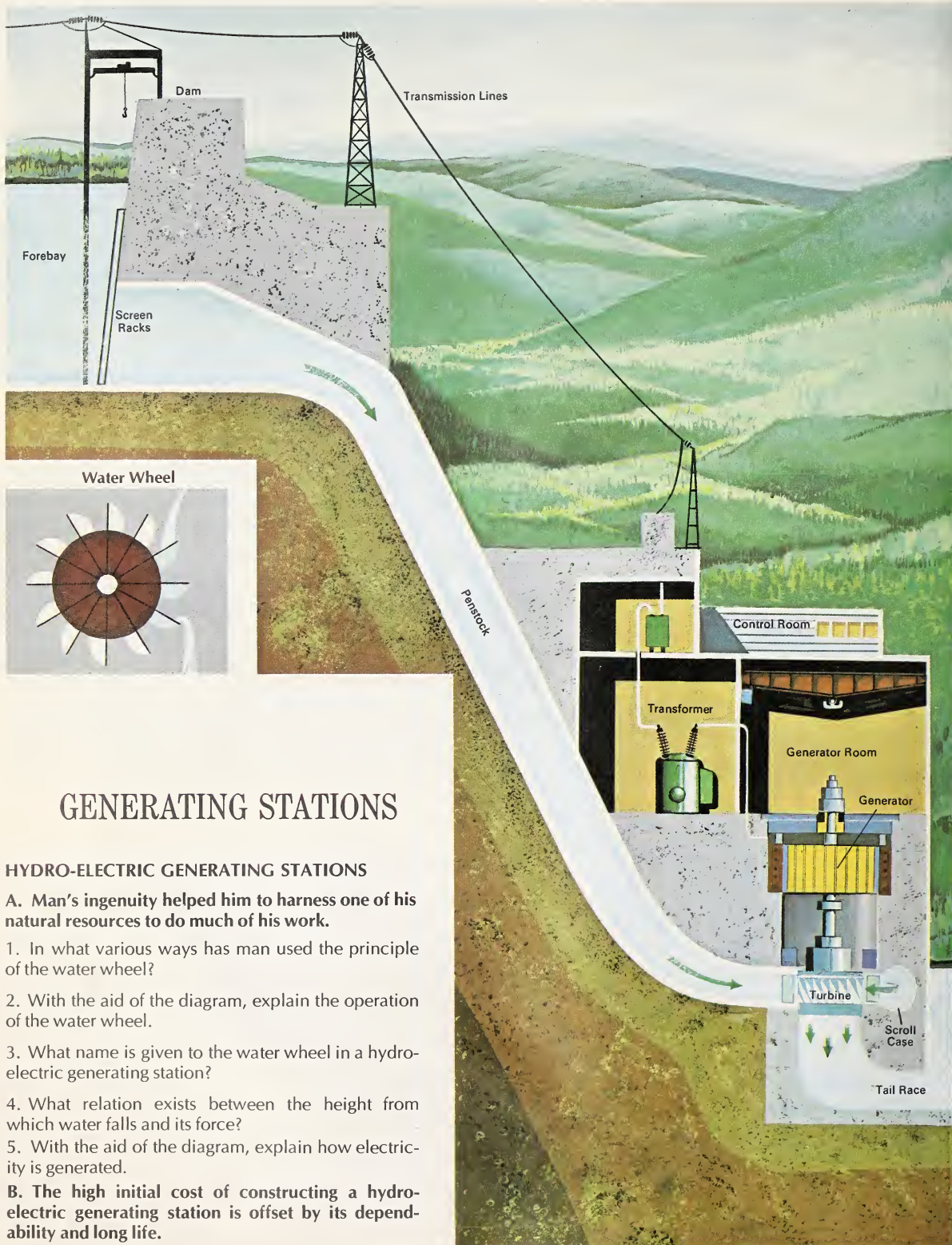




**Nuclear Generating Station at Douglas Point**

7. Suggest why some people object to a thermal or a nuclear generating station being built in their locality.





## GENERATING STATIONS

### HYDRO-ELECTRIC GENERATING STATIONS

**A. Man's ingenuity helped him to harness one of his natural resources to do much of his work.**

1. In what various ways has man used the principle of the water wheel?
2. With the aid of the diagram, explain the operation of the water wheel.
3. What name is given to the water wheel in a hydro-electric generating station?
4. What relation exists between the height from which water falls and its force?
5. With the aid of the diagram, explain how electricity is generated.

**B. The high initial cost of constructing a hydro-electric generating station is offset by its dependability and long life.**

Explain the above statement.

Figure 21 — Hydro-electric Generating Station

## THERMAL GENERATING STATIONS

C. Steam is the agent that drives the turbine in a thermal generating station.

1. Refer to the diagram, and explain how steam can propel a turbine.

2. In a thermal generating station, what fuels may be used to fire the boiler?

3. Give two reasons why thermal generating stations are built near water.



Figure 22  
Steam Generator

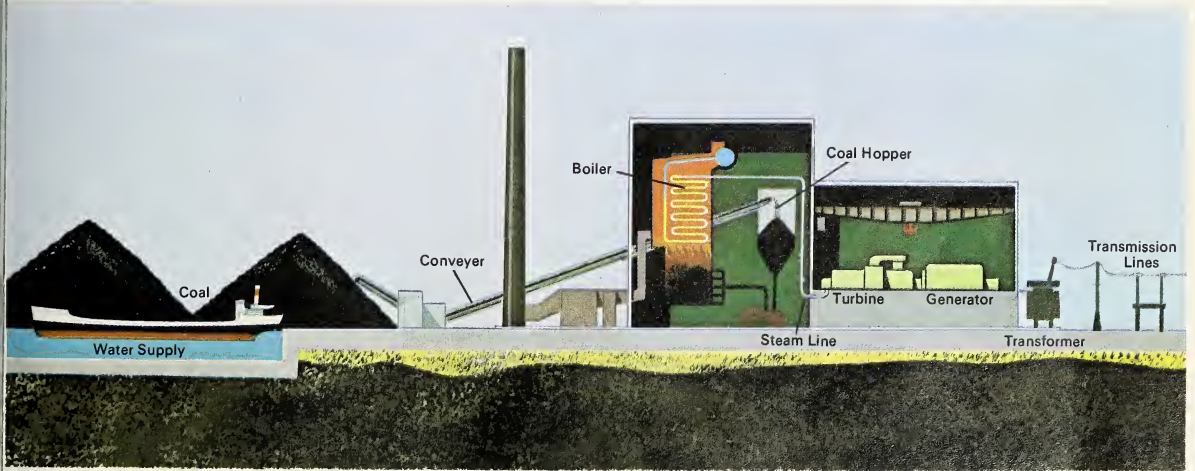
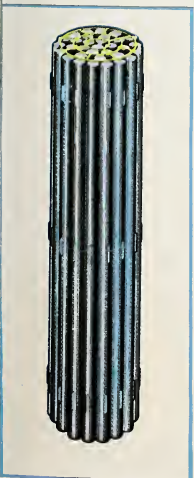


Figure 23 – Thermal Generating Station



Fuel Bundle

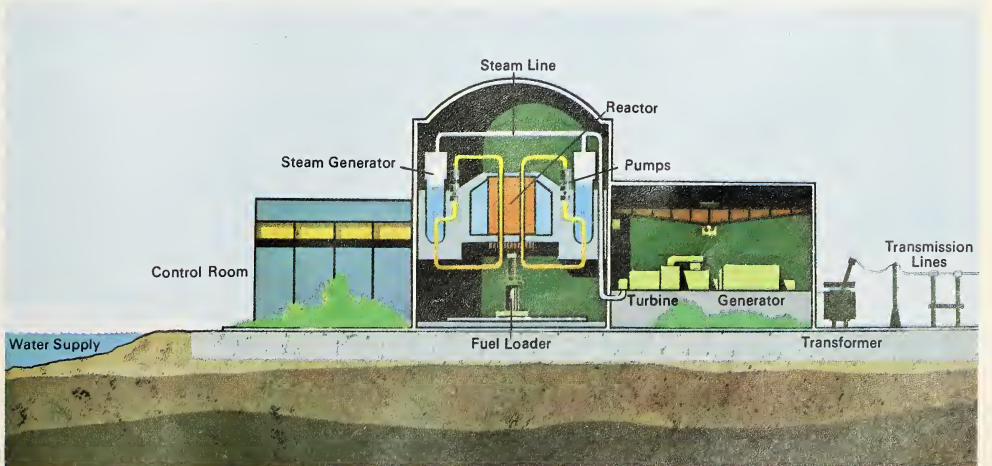


Figure 24 – Nuclear Generating Station

## NUCLEAR GENERATING STATIONS

D. Nuclear generating stations have also been built to produce electricity.

1. For what purpose is uranium used in a nuclear generating station?

2. Match the endings of each sentence in column B with the proper beginning in column A.

A

B

(a) Spent fuel bundles

— give off no smoke.

(b) Nuclear generating stations are cleaner than thermal generating stations because they

— are cheap to transport and last a long period of time.

(c) Fuel bundles

— are stored underwater in tanks for safety.



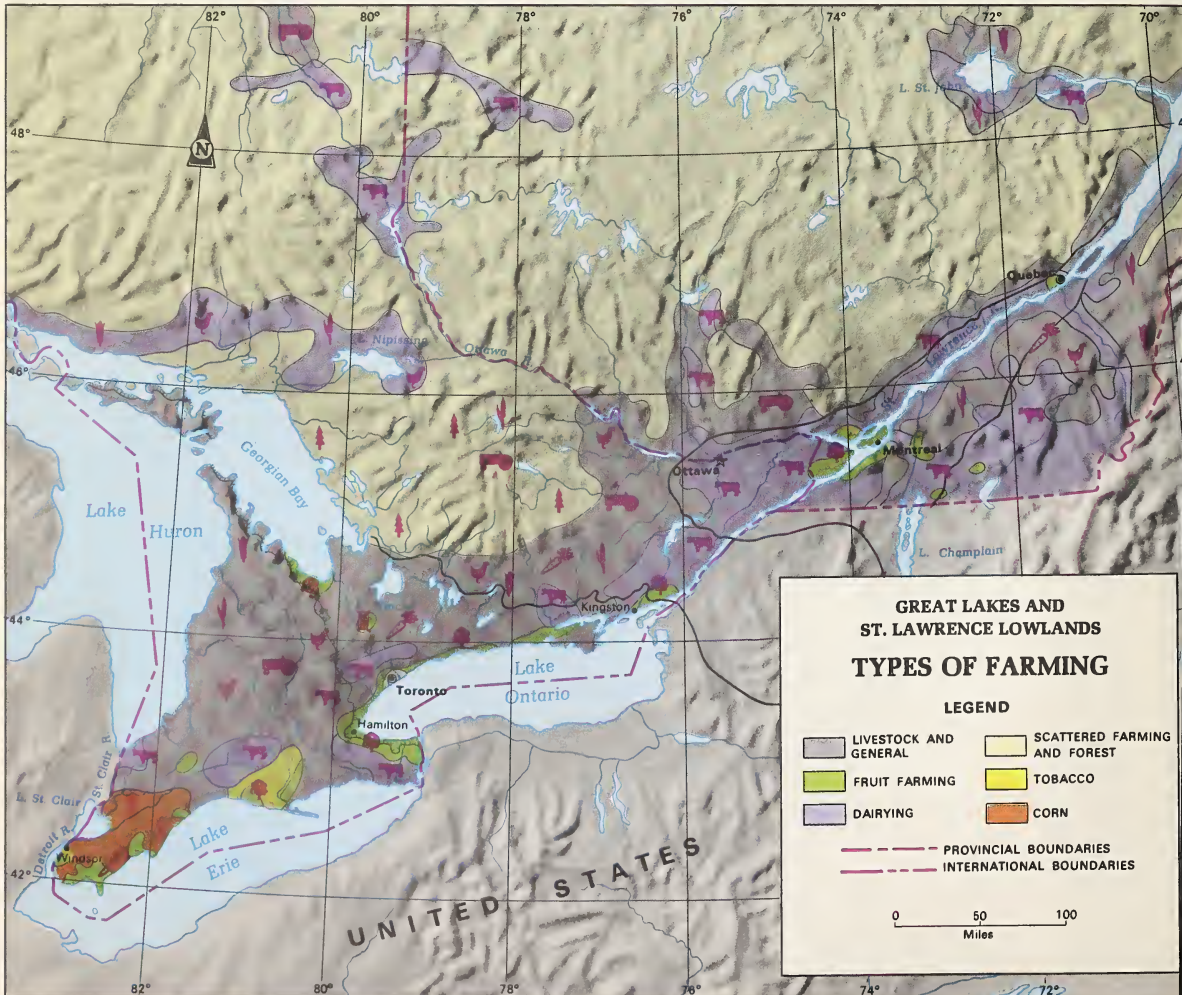


**Dairy Belt.** What crops does a dairy farmer grow?



**Tobacco Belt.** Identify the buildings.

Map 25





**Holland Marsh.** What does the meandering river signify?

# TYPES OF FARMING

Some of the richest farmland in Canada is found in the Lowlands.

Four important factors that determine the type of farming found in an area are: (a) the amount of rainfall, (b) the kind of soil, (c) the length of the growing season, and (d) the proximity to a market.

What is the average annual precipitation in this region?

In what type of soil (sandy, clay, or till) do the following crops, grow best: (a) tobacco, (b) truck crops, (c) fruit, (d) corn, and (e) wheat?

What two areas in this Region provide the largest market for crops?

Of the four factors listed above, which is the most important to the following types of farming: (i) corn, (ii) tobacco, (iii) fruit, and (iv) dairying?

What important industries are a direct result of each type of farming named above?

List towns or cities associated with these industries.

## DAIRY BELT

Dairying is one of the oldest industries in Canada. French settlers brought cows from France in the early 1600's.

Examine the photograph. What evidence is there that this is a prosperous farm?

Identify the buildings and describe their uses.

- What breed of dairy cattle is kept on this farm?
  - Name three other well-known breeds of dairy cattle and give their chief advantages.
- How large is the Dairy Belt, and how far does it extend?
- Why is proximity to market the chief factor in the location of a dairy farm?
- What modern developments have lessened the importance of distance to markets?

## B. Butter and cheese are two important dairy products.

Name three cities in the Dairy Belt noted for their cheese factories.

## C. Hog raising is also a source of revenue in the Dairy Belt.

- What connection is there between hog raising and dairying?
- How many gallons of milk does the average Holstein cow give in a week?
- What major expenses does a dairy farmer have?

## TOBACCO BELT

A. Tobacco can be grown in soil unsuitable for other crops.

- What kind of soil and climatic conditions are necessary for growing tobacco?
- Where are the chief tobacco-growing areas located?
- Why is tobacco difficult to grow?
- Explain the functions of the kiln and the greenhouse on a tobacco farm.

B. The government carefully controls the amount of tobacco that a farmer may grow.

How does this affect the tobacco industry?

## HOLLAND MARSH

- Locate the Holland Marsh in relation to Toronto.
- How did the farmers from another country help to make this area suitable for farming?
- On the air photo, identify a stream, drainage canals, and roads.
- Name the main products grown here.
- What means are used to ship products from the Holland Marsh to market?



85







**Vertical Aerial Photograph of the Grimsby Area**  
Compare with Map 26. Locate the Filtration Plant, Hospital, and main highway.

## NIAGARA FRUIT BELT

**Part of the Niagara Fruit Belt is shown on Map 26.**

Locate the boundaries of the Niagara Fruit Belt.

What is the origin of the clay loam soils of this area?

What effect has the water of Lake Ontario on the blossoms of the fruit trees in the early spring?

(a) Name the town shown on the map and locate it on a road map of southern Ontario.

(b) What direction is the lake from the town?

(c) How far is the town from Toronto?

Identify the main highway passing through this area.

(d) What is the benefit of a highway such as this to the fruit farmers?

**Recently, rich farmlands have become sites for non-agricultural developments.**

How has the highway encouraged this development?

To preserve the valuable farmland, suggest other locations for a main highway.

How is elevation indicated on the map?

Locate the Niagara Escarpment. Give at least three reasons for the greater number of orchards located below the Escarpment than above it.

5. How does the Escarpment protect the tender fruit trees from frost?

6. Name some fruits grown in this area?

7. What type of soil is best suited for grapes?

8. If you were buying a farm in this area, what factors would you consider prior to purchase?



**Niagara Fruit Belt.** Identify the fruit trees and the season of the year.





**Montreal Plain.** Account for the Settlement Pattern.

## MONTREAL PLAIN

**A. Although production in this area is similar to that in Ontario, the shape of the farms is unique.**

1. Where are the houses located in relation to the road?
2. From the picture, draw a map of this area to show: (a) the highway, (b) the boundaries of the farms, (c) the farm buildings, and (d) the town. (Do not break up each farm into individual fields.)
3. What is the shape of the fields?  
(a) Account for this shape.
4. If the photograph was taken at noon, in which direction was the photographer facing?
5. Describe the relief of this region.

6. What urban centre would provide a large market for the farm produce of this area?

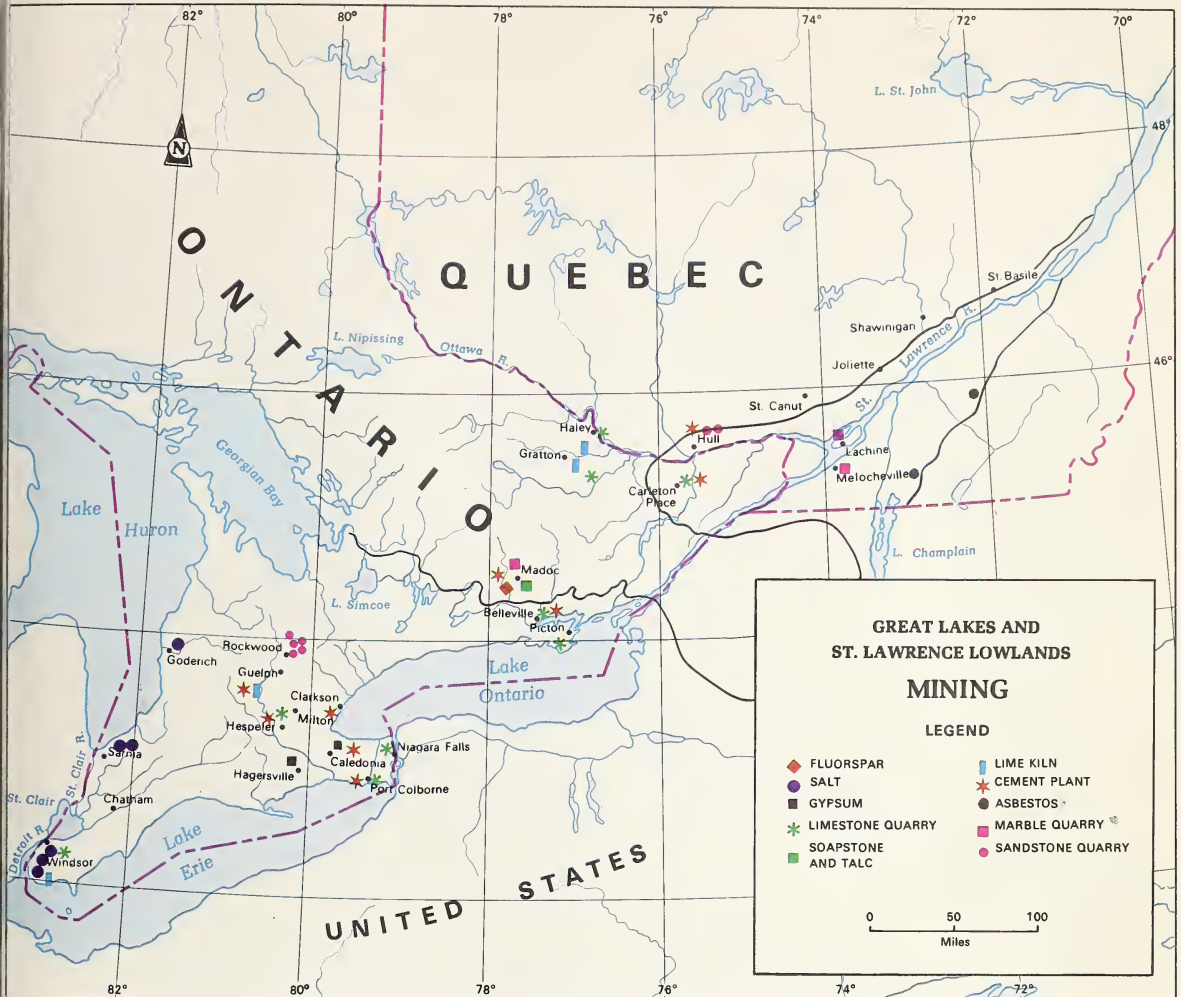
7. What is happening to farmland near large cities?

8. What climatic advantage and disadvantage has the Lawrence Lowland in relation to the Great Lakes Lowland?

9. Where are the following produced in Quebec:  
(a) apples, (b) tobacco, (c) dairy products, and (d) sugar beets? Tell why they are found at each place.

**B. The seasonal routines on a farm are peculiar to the type of farming carried on.**

Select three of the five photographs showing types of farming and compare and contrast the seasonal work of the farmers.



ap 27

## MINING

Mining includes digging for metals and building materials as well as drilling for minerals and natural gas.

Divide your workbook page into four equal columns. Label the first column Mineral, the second, Symbol, the third, Location, and the fourth, Use.

In the first column, list the minerals mined in the lowlands Region.

In the second column, draw the symbol used on the map for each mineral.

In the third column, list the important areas where the mineral is mined.

In the fourth column, list the chief use of the mineral.

Why is there such a quantity of building materials produced in southern Ontario?

What are the different advantages of limestone, marble, and granite, as building materials?

B. Asbestos, like some other minerals in this region, is mined in "open pits".

1. What is meant by open-pit mining?

(a) Where is this method of mining possible?

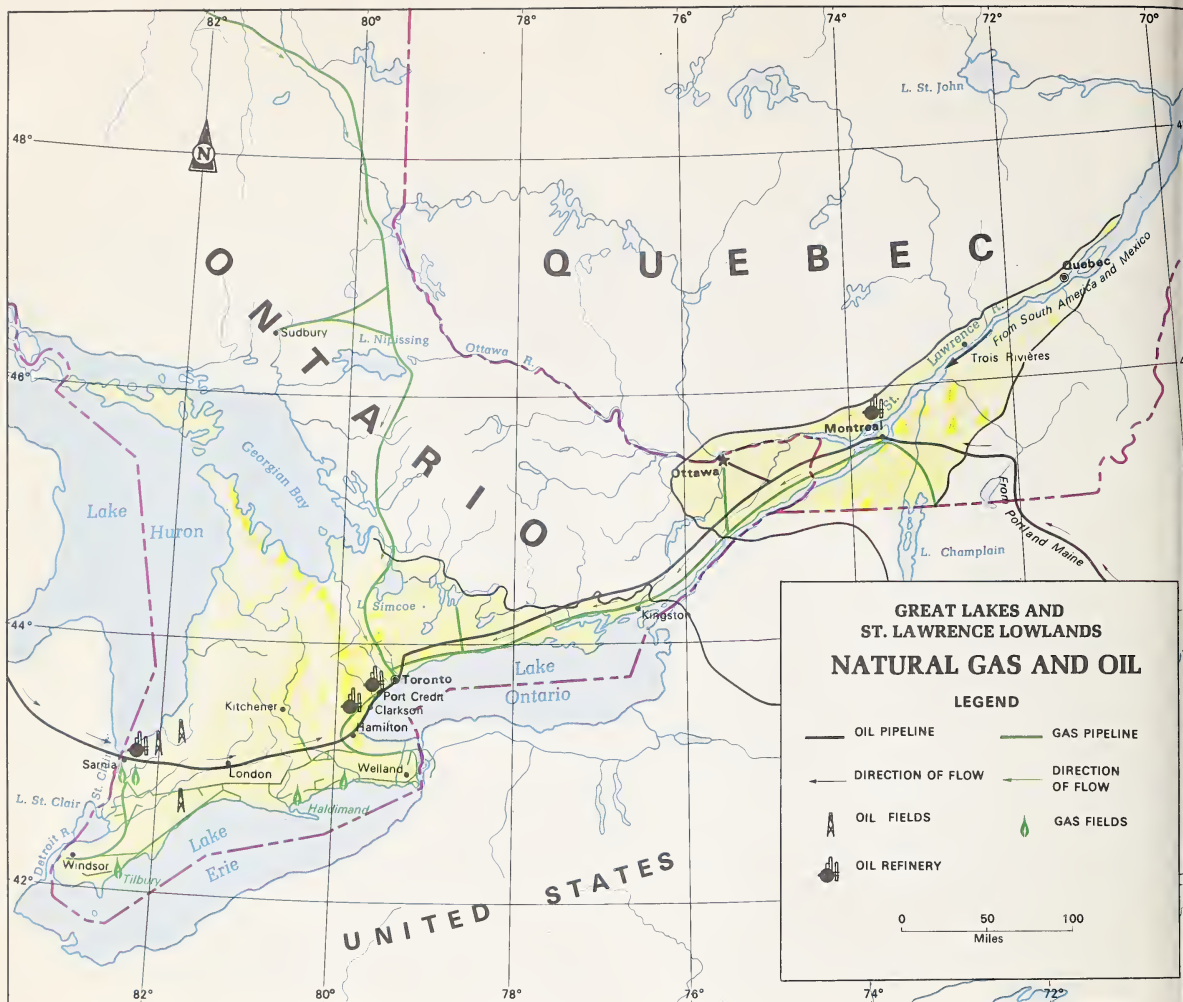
(b) What makes it possible?

2. What are the advantages of open-pit mining over shaftsinking or tunnelling?



Open-Pit Mining. How is cement made from limestone?





Map 28

## NATURAL GAS AND OIL

### A. Natural gas is one of Canada's biggest assets.

1. Where are the principal natural gas fields of southern Ontario located?
2. What province supplies most of the natural gas used in the Lowlands Region?

### B. Chemists are able to change natural gas into many other products.

1. List five common products made from natural gas.
2. When natural gas is piped into homes as fuel, how can the amount be measured?

### C. Natural gas is almost colourless and odourless.

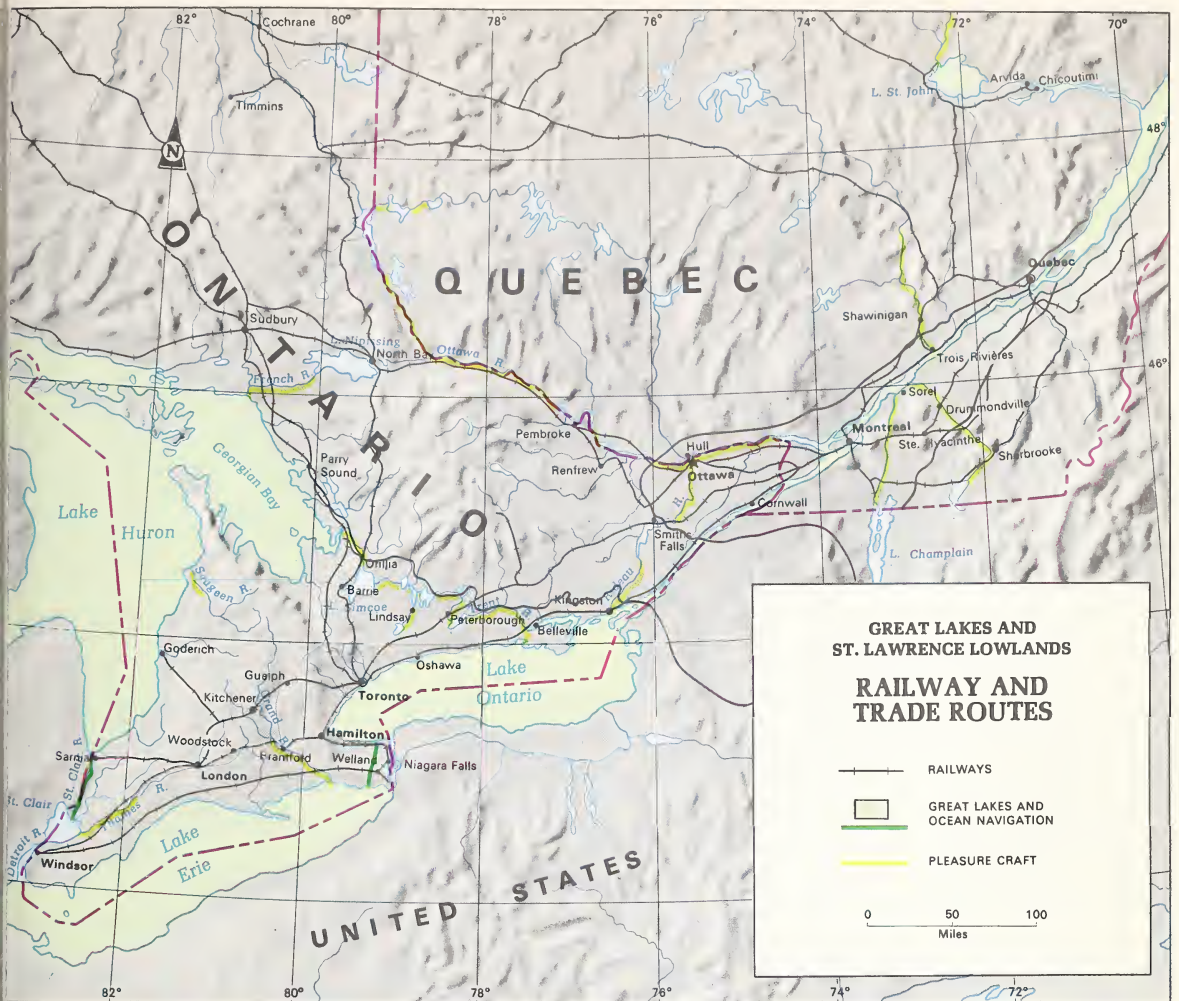
1. How do gas companies help the consumers detect leaks?
2. Describe how natural gas is obtained.

### D. Oil is one of the most important of natural resources in the world today.

1. Name three cities that are close to oil refineries.
  - (a) Which area refines the most oil?
2. What are the sources of the oil used in the Toronto area?
  - (a) How is the oil transported from each source to Toronto?
3. What are the advantages of a pipeline over other means of transportation?
4. How is a pipeline laid and how does it operate?

### E. One of the chief uses of oil is home heating.

1. List four products found in or around the home that are refined from oil.
2. How do scientists believe that oil was formed?



Map 29

## TRANSPORTATION

### RAILWAYS

As railways grew, population and industry grew.

Explain why this happened.

What effects did the completion of a transcontinental railway have on Canada as a whole?

Name the two transcontinental railways in Canada.

How have they attempted to compete with other means of transportation?

What are the advantages of diesel engines as opposed to steam engines?

What cities of this Region serve as major railway centres?

Give as many reasons as you can to show why railways are important to: (a) industry, (b) farming, and (c) individuals.

Why might the railway companies have originally opposed the building of the St. Lawrence Seaway?

### WATERWAYS

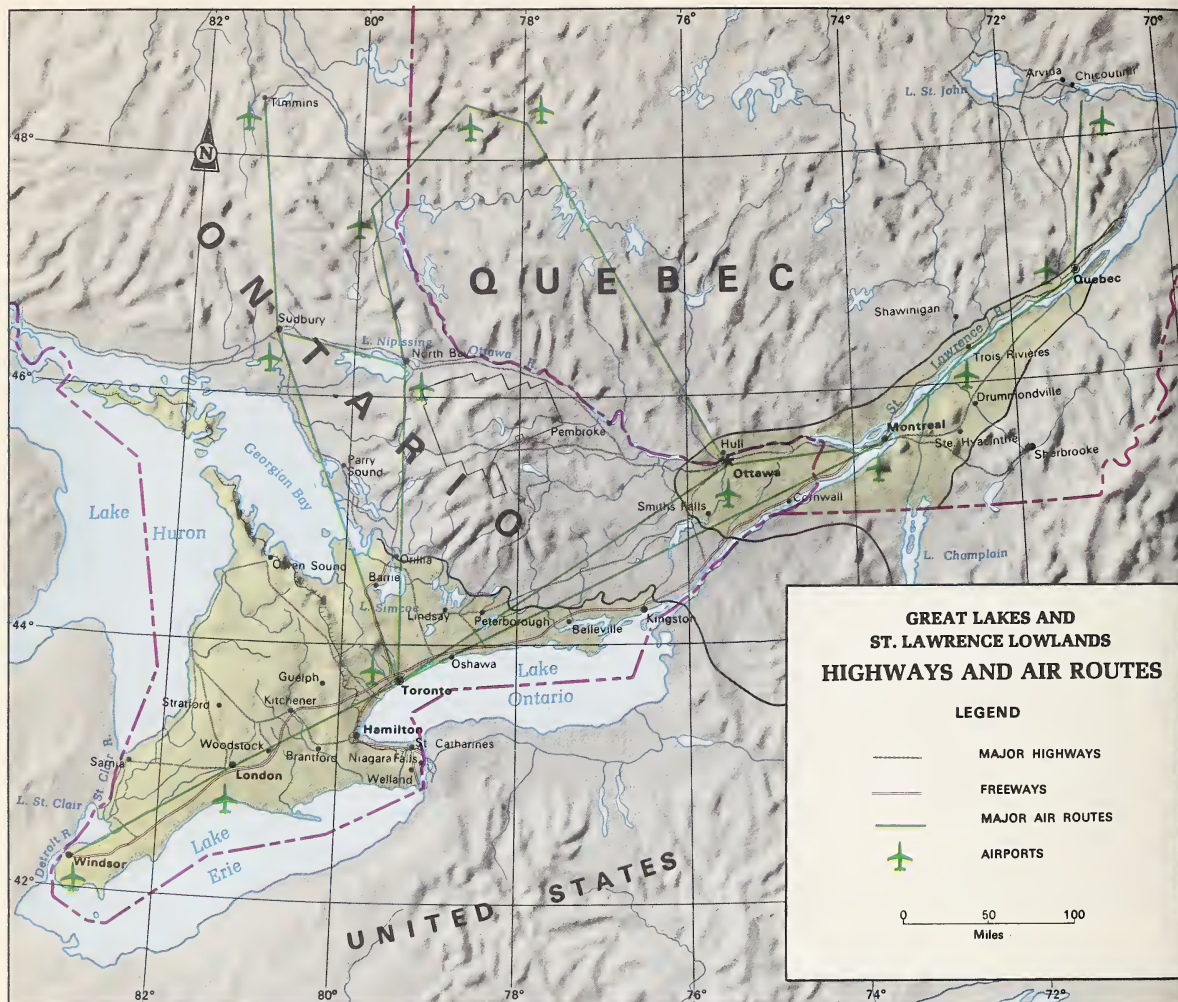
**B. In the early days of Canada, water was the best, and sometimes the only, means of transportation.**

1. Why was this so?
2. What types of vessels were most used on the waterways, and what were their cargoes?
3. Explain the relation between early settlements and water routes.

**C. Canals are man-made waterways that have been built for various reasons.**

1. Divide a page of your workbook into four columns. Head the first column Canal, the second, Original Use, the third, Length of System, and the fourth, Today's Use.
  - (a) In the first column list the following canals: Rideau, Trent, and Welland.





Map 30

(b) In the second column state the reason for the construction of each canal.

(c) In the third column give the length of each system.

(d) In the fourth column state the chief use of the canal today.

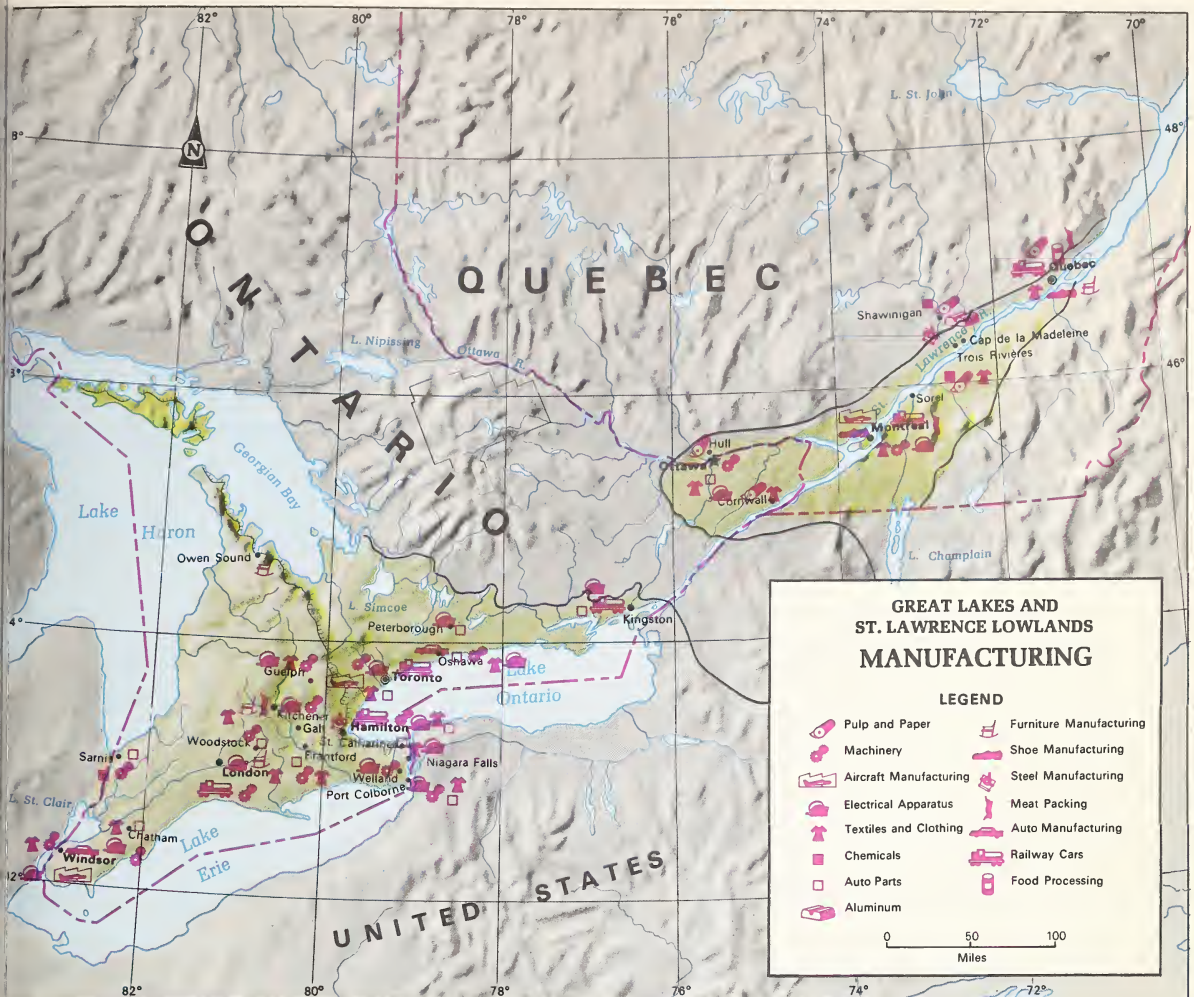
**D. The Great Lakes are used chiefly by ocean and lake freighters rather than passenger ships.**

1. What freight is carried from the Lakehead to eastern ports?
2. What cargoes are loaded on ships for the return voyage?
3. What are the advantages of sending freight by ship rather than by other means?
4. How is weather a major problem in the operation of the Seaway?

## HIGHWAYS

**E. There are more good roads in southern Ontario than in southern Quebec.**

1. How many miles of highways are there in each of these two provinces?
2. Why are there so few major roads running north from the St. Lawrence River between Trois Rivières and Quebec?
3. Where do provincial governments obtain revenue to build and maintain highways?
4. Because of the increase in the number of good roads, what form of transportation now competes with railways?
5. How do good roads help: (a) the farmers of this Region, (b) the consumers of this Region, and (c) the tourist industry in this Region?



Map 31

1. On a Province of Ontario road map:
  - a) How is mileage indicated between two nearby centres?
  - b) How is mileage indicated between two large centres?
  - c) How far is it from North Bay to Niagara Falls?
  - (i) What highways provide the best route between these two centres?

## AIRWAYS

2. The invention of the airplane shrank the size of the world.

3. Comment on the above statement.

4. Name Canada's two main airlines.

5. Compare travelling between Toronto and Quebec City by air, rail, and road, in terms of distance, time, and cost.

6. Three types of engines used on aircraft are piston, turboprop, and jet.

1. Explain briefly how each operates.

(a) Explain why jets are replacing piston engines.

2. Tell the best means of transporting the following from Montreal to Windsor and explain your choice:

- (a) automobiles, (b) wrist watches, (c) strawberries, (d) flowers, (e) petroleum, (f) cattle, (g) tourists, (h) lumber, (i) furniture, and (j) heavy machinery.

## MANUFACTURING

A. Manufacturing is the combining or processing of raw materials to make finished products.

1. List several finished products that are manufactured from: (a) logs, (b) iron ore, and (c) farm produce.

2. What proportion of all Canadian manufacturing is done by Ontario and Quebec combined?



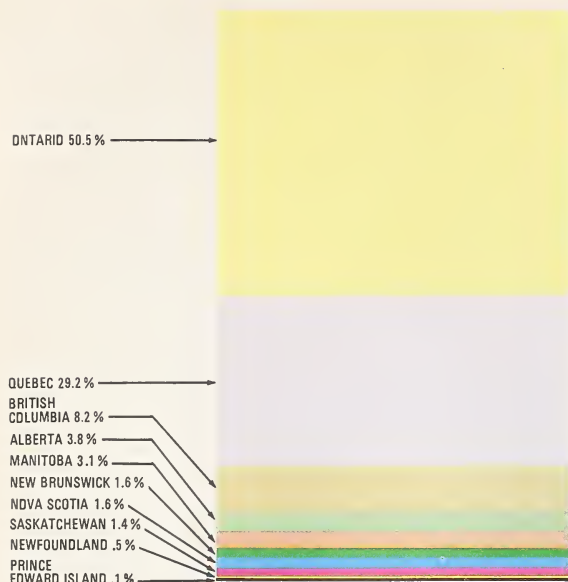


Figure 25 — Percentages of Canadian output of manufactured goods by provinces.

**B. Listed are five factors affecting manufacturing: (a) skilled workers, (b) raw materials, (c) market for products, (d) transportation, and (e) cheap and abundant power.**

1. Explain the conditions in the Great Lakes and St. Lawrence Lowlands that favour each factor.
2. Below, in column A, are names of important manufacturing centres. Match these with the appropriate manufactured product or products listed in column B.

| A              | B   |
|----------------|---|
| Montreal       | — automobiles.                                    |
| Shawinigan     | — diesel railway engines, electric equipment.     |
| Trois Rivières | — garment industry, cigarette manufacturing.      |
| Oshawa         | — oil refining, chemicals.                        |
| Windsor        | — heavy machinery, greatest manufacturing centre. |
| Hamilton       | — aluminium.                                      |
| Toronto        | — furniture, clothing.                            |
| St. Catharines | — automobiles, trucks, tractors.                  |
| Sarnia         | — paper, textiles.                                |
| Kitchener      | — farm implements, electrical appliances.         |
| London         | — iron and steel, automobile parts.               |

3. What factors affect the price of a manufactured article?
4. If you were president of a new canning company, where in the Lowlands would you build your factory, and why would you choose that particular location?

### C. The Great Lakes and St. Lawrence Lowlands is the hub of Canada's manufacturing industry.

On an outline map of southern Ontario:

- (a) Mark the following centres and label them clearly: (i) Niagara Falls, (ii) St. Catharines, (iii) Hamilton, (iv) Burlington, (v) Oakville, (vi) Port Credit, (vii) Brampton, (viii) Metropolitan Toronto, (ix) Ajax, and (x) Oshawa.
- (b) Draw a line inland from Oshawa, around the above-named centres to Niagara Falls and shade the area orange.

### D. The area you have shaded is referred to as the Golden Horseshoe.

1. Why is Golden Horseshoe a good name for this area?
  - (a) Mark the following centres: (i) Guelph, (ii) Waterloo, (iii) Kitchener, (iv) Galt, and (v) Brantford.
  - (b) Name the chief industry in each of the above centres.
2. What were the original industries of the Grand River Basin?
  - (a) Although hardwood must now be imported, account for the fact that the furniture-making industry still exists in this area.
  - (b) Suggest one reason why industry has not grown as rapidly in this area as it has in the Golden Horseshoe.

### E. Often one industry will attract others that require its product.

1. What three industries would be attracted by each of the following: (a) a steel mill, (b) an electrical company, (c) an oil refinery, (d) a tannery, (e) a paper-making company, and (f) a flour mill.
2. Describe the advantages enjoyed by industries that select sites outside metropolitan areas in terms of: (a) cost of land, (b) transportation facilities, (c) company expansion, and (d) advertising.

### F. Being situated between Canada's two largest markets one would expect a centre such as Kingston to be an industrial giant.

Using the table, Truck Transport Rate, explain why it is better for an industry that serves both Toronto and Montreal to be located in one of these cities and not between them.

#### Truck Transport Rate per Hundred Pounds

| Route                | Rate  |
|----------------------|-------|
| Kingston to Toronto  | \$2.7 |
| Kingston to Montreal | \$2.0 |
| Toronto to Montreal  | \$2.9 |
| Montreal to Toronto  | \$2.9 |

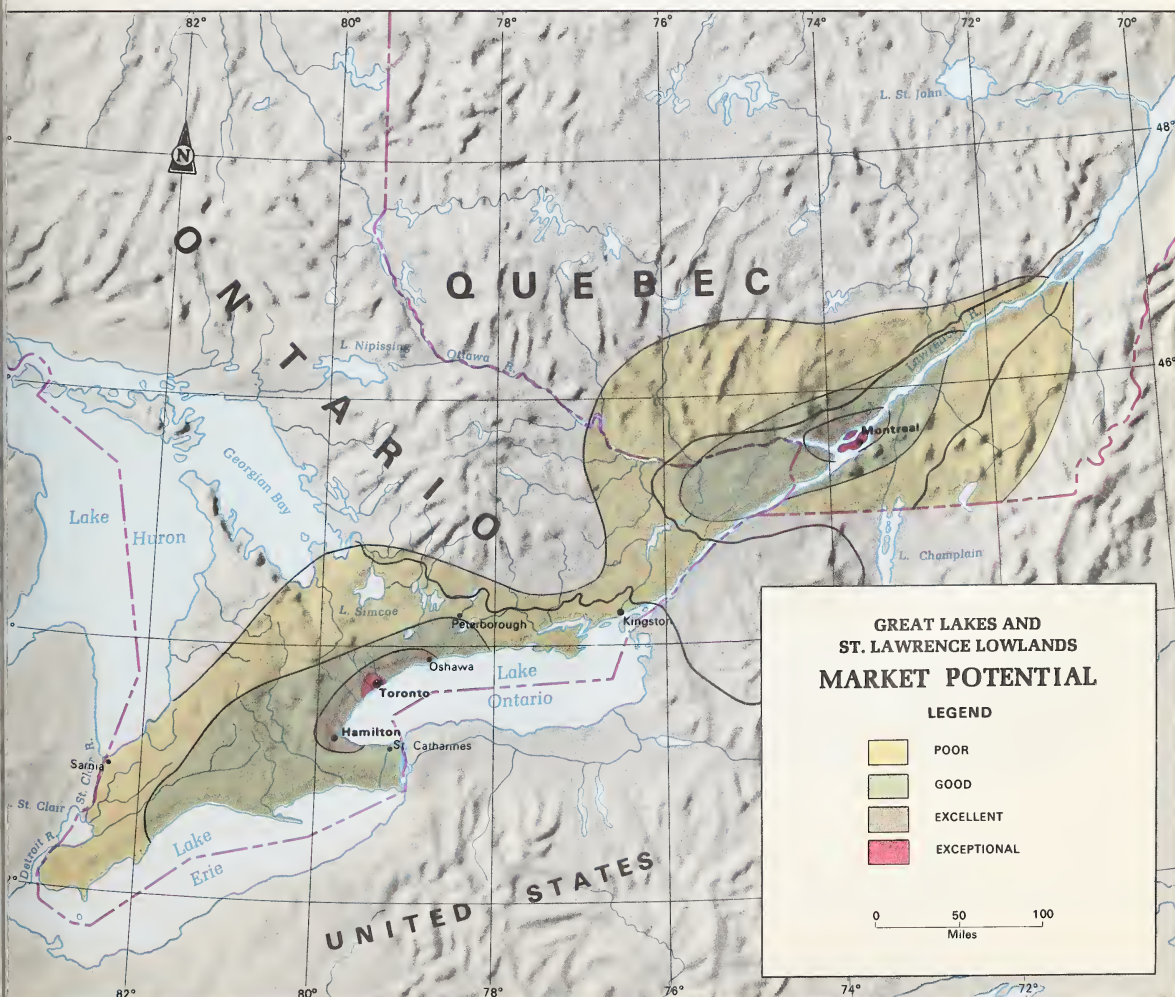
Prices as of July 7, 1967.



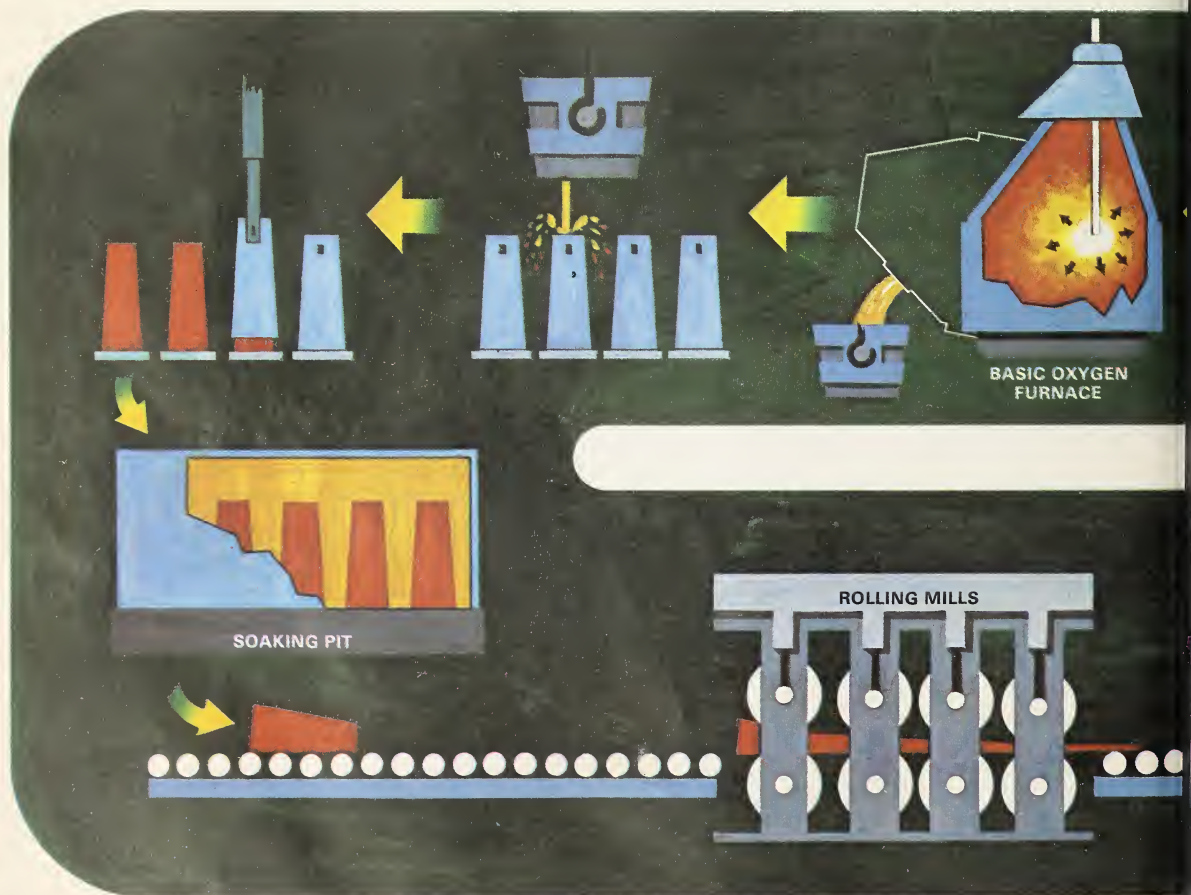
Automobile Industry. How has the production line lowered prices for the consumer?

|                             |           |
|-----------------------------|-----------|
| METAL INDUSTRIES            | \$439,719 |
| PETROLEUM AND COAL          | \$420,793 |
| CLOTHING                    | \$334,625 |
| AUTOMOTIVE INDUSTRIES       | \$247,352 |
| TEXTILES                    | \$175,962 |
| MEAT PACKING                | \$157,835 |
| PAPER AND ALLIED INDUSTRIES | \$153,292 |
| TOBACCO                     | \$135,528 |

Figure 25A — Shipping Values of Montreal's Production







## IRON AND STEEL

A. Hamilton's location on the Great Lakes—St. Lawrence Seaway is probably the chief cause of its success in the iron and steel industry.

1. Explain why this is so in terms of: (a) coal, (b) limestone, (c) water, (d) iron ore, and (e) electricity.

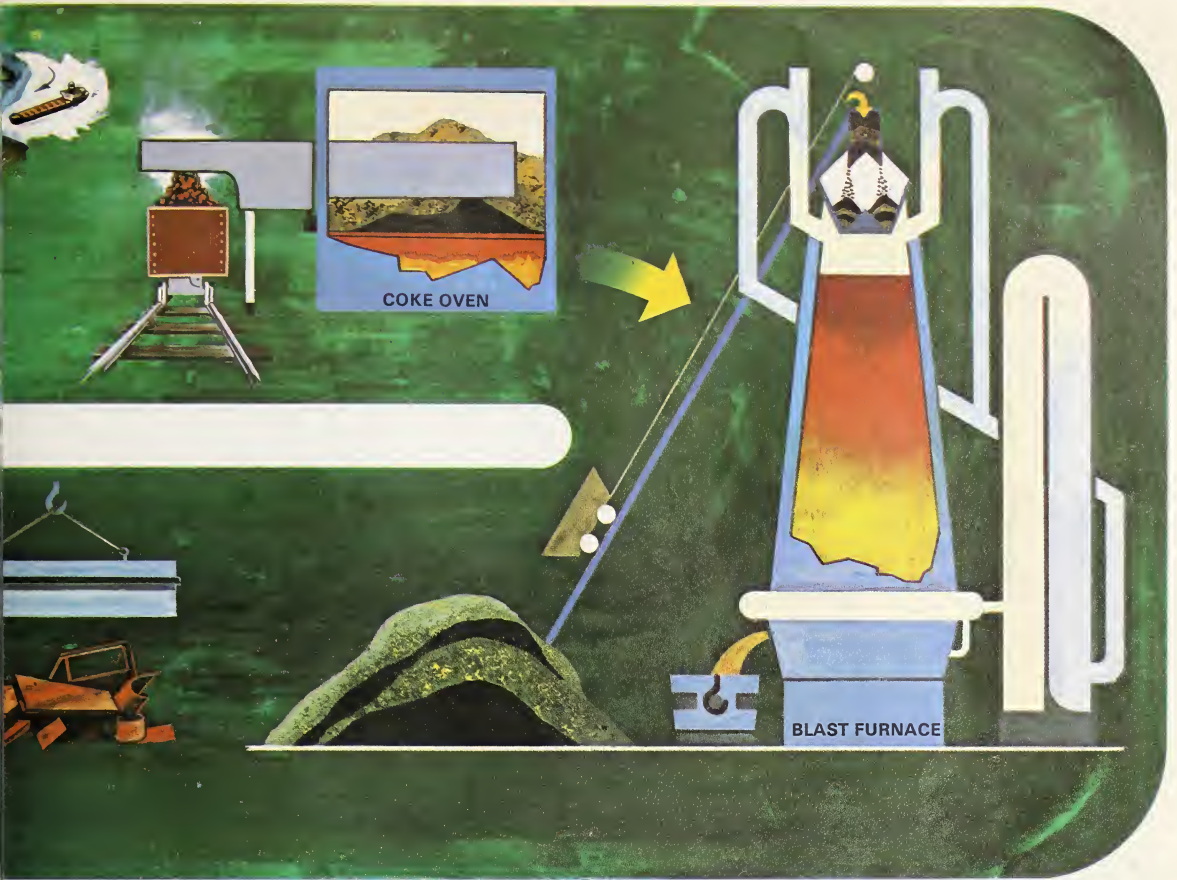


Figure 26—Steel—Raw Materials to Finished Products

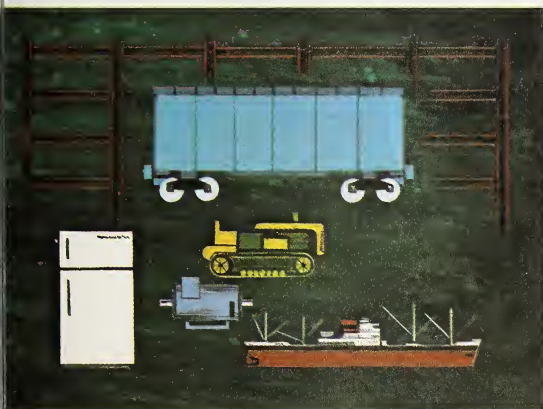
following in order of importance and explain your selection: (a) cheap and abundant power, (b) nearness to raw materials, (c) good market for products, and (d) skilled workers.

5. Define the following: (a) iron, (b) steel, (c) ingot, (d) slag, (e) primary steel product, (f) secondary steel product, (g) pig iron, (h) coke, and (i) coke oven.

6. Using the diagram, outline the process for making iron with a blast furnace.

**B. Controlled amounts of scrap metal are added to the molten iron in the basic oxygen furnace to produce steel.**

Describe the operation from the basic oxygen furnace to the rolled steel.



How are the above five commodities used in the production of iron and steel?

What are the advantages of having steel mills in milton rather than in: (a) Toronto, (b) Fort William, or Schefferville?

With regard to the steel industry in Hamilton, list the





**Steel Industry.** Identify four factors favouring location for a steel plant on Hamilton harbour.

## TROIS RIVIERES AREA

**A. The Trois Rivières plain was once part of the bed of the Champlain Sea. (See glaciation, Page 19.)**

Describe the surface and quality of the soil of this plain.

**B. Because of the climate and soil, hay is the chief crop.**

What profitable type of farming will this crop support?

**C. A nearby market is necessary for successful dairy farming.**

1. If the urban population is about half the total population, what is the total population?

2. Which crop is best suited to the sandy soils north of Trois Rivières? (See page 33).

3. At the junction of what two rivers is Trois Rivières located?

4. Name two important uses of each river to this city.

**D. Timber and hydro-electric power from the St. Maurice River valley make pulp and paper the chief industries.**

1. From the photograph, name Trois Rivières' most important export.

2. What city serves as a port for the industrial centres of the St. Maurice River?

3. Why are both road and rail, rather than water, used to transport goods to and from these areas?



**Trois Rivières.**

**E. Harnessing the St. Maurice River was a challenge because the flow of water ranged from 875 tons per second during the spring to 30 tons per second in summer.**

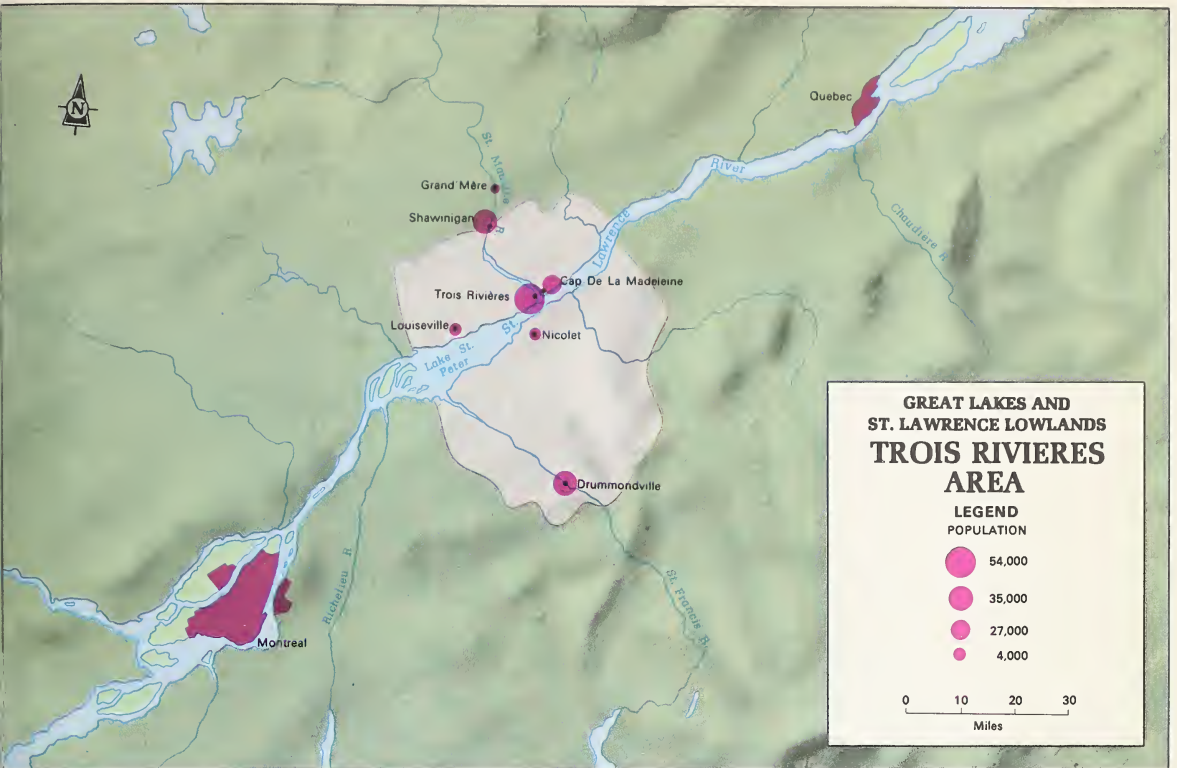
1. Account for this difference in rate.

2. How has the flow been regulated to a constant tons per second?

3. What is the chief industry of Drummondville, and Louiseville?

4. What factors have helped make Trois Rivières a major industrial port?



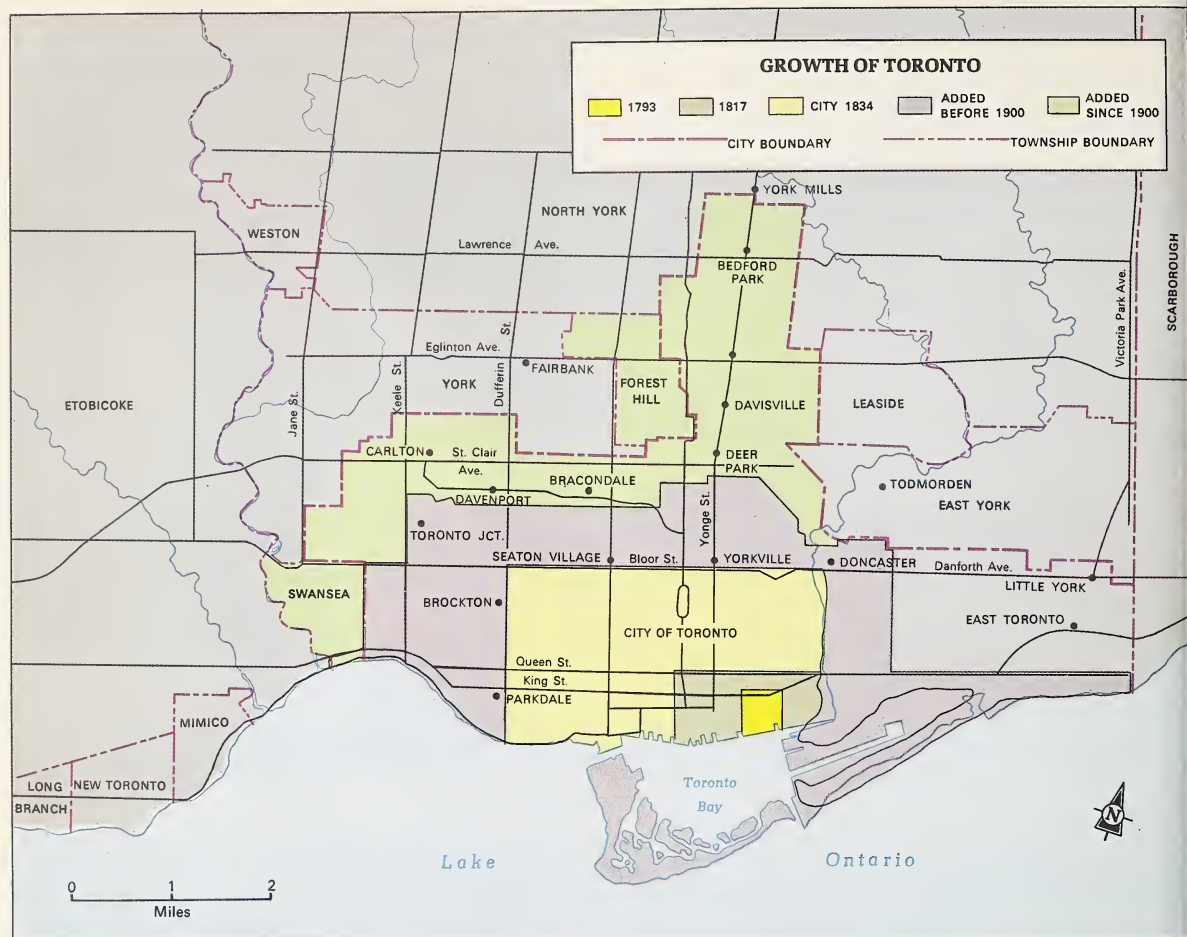


Map 33



Shawinigan . List two important activities of the centre.





Map 34

## TORONTO

**A. Much of what is now Toronto was once submerged under Glacial Lake Iroquois, which was the forerunner of Lake Ontario. (See page 19.)**

1. Explain why the southern part of Toronto is fairly flat, whereas the northern part is hilly.
2. Account for the continuous line of bluffs across most of Toronto.
3. How do these steep hills affect winter traffic today?
4. How does the map show that the rivers flowing into Lake Ontario are very old?

**B. Toronto Island started forming some 5,000 years ago as a spit of land. (See Figure 27.)**

1. Explain the meaning of the term spit and tell how the

island was formed, using the following words: current, Scarborough Bluffs, eroded, Don River deposit.

2. How does the island improve Toronto harbour?
3. Explain why the "Direction of Current" (Figure 27) is in a westward direction counter to the main flow of the lake.

**C. The name Toronto comes from an old Indian word Taranto. Some scholars claim that it meant "place of meeting".**

1. Who met here in pioneer days?
2. Why was this a good "place of meeting"?

**D. In 1793, Governor Simcoe selected a spot near the mouth of the Don River as a site for the settlement of York.**

1. If you had been governor, what might have been your reasons for this choice?

How many miles is it from the harbour to the north limits of the city of Toronto?

How many miles along Bloor-Danforth is it from the west limit to the east limit of the city?

**Toronto is a centre for rail, road, and air traffic; this is one of the reasons why it is Canada's second industrial city.**

On a map of Toronto, mark the following:

A railway running east and west through the middle of the city.

(i) Mark on it where the following are made; light-iron products, paper products, printed products, and toys.

(ii) What factors largely determined the position of this line?

A railway following the Lake Ontario shoreline.

(i) Mark on it the following in the three sections named:

Western — iron and steel manufacturing.

Central — warehouses, flour mills, and food processing.

Eastern — storage for coal, petroleum, and steel.

(ii) Why are the above located in these parts of the city?

(c) A railway from the docks to the northwest and to the northeast.

(i) Mark on it the following types of industry:

Triangular area to the west — meat packing, and rubber products.

Lower Don Valley — metal scrap yards, and paint and chemicals.

(ii) Why are the deep river valleys, once a hindrance to growth in the city, now considered an advantage?

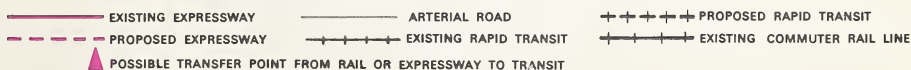
2. Of the industries that have been listed, what factors determined the location of each?

3. Name some of the advantages and disadvantages of Toronto's location as a city.

Map 35



### CITY OF TORONTO - TRANSPORTATION







**Toronto Harbour.** Locate this Area on Figure 27 (Physical Features).



**Toronto Looking East.** What industries are served by the rail and harbour facilities?





Figure 27—Physical Features of the Toronto Area

## MONTREAL

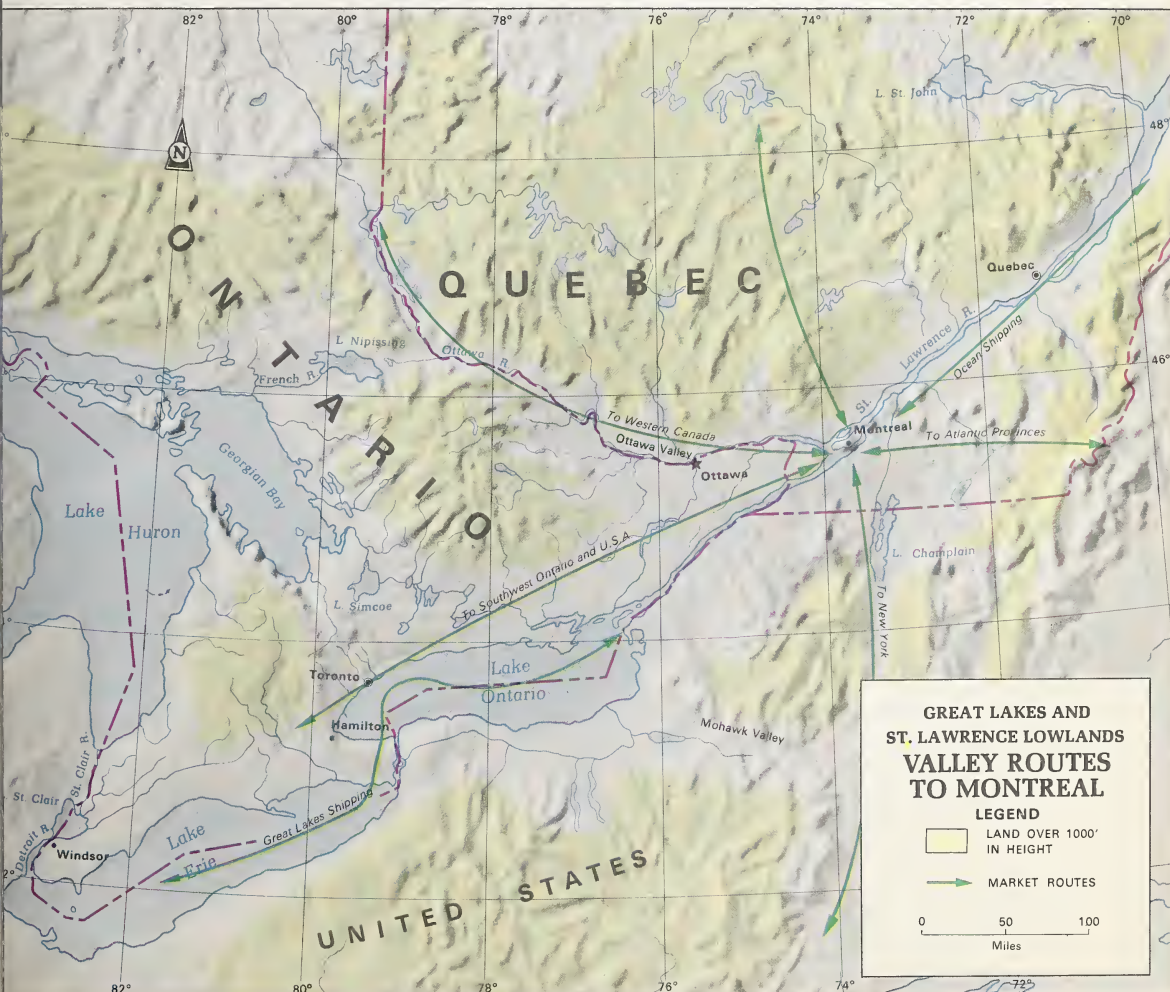
History helps to explain why Montreal is Canada's easternmost port, and its largest city.

At the height of the fur trade, why did ships from the Old World stop at Montreal and not continue upriver to the

### B. Montreal became a transshipment point.

Explain the term transshipment, and describe the two types of ships involved during the days of the fur trade.

Great Lakes and the source of the furs?





**C. In 1837 a Canadian railway was linked up with a United States line to form a direct route between Montreal and New York City.**

In what direction from Montreal would this line run?

**D. Canada's largest city is located on an island.**

1. What is the population of Greater Montreal?

(a) What is its area in square miles?

(b) Compare these with your community.

**E. In the centre of this city there is a predominant land-form.**

1. What is it called?

(a) How was it formed?

2. Account for the location of the commercial area.

3. What is the source of electric power for the area?

4. What characteristics does Montreal have that makes a successful manufacturing centre?

**F. A successful city must have easy access to food supply**

1. Where do the markets of Montreal obtain:

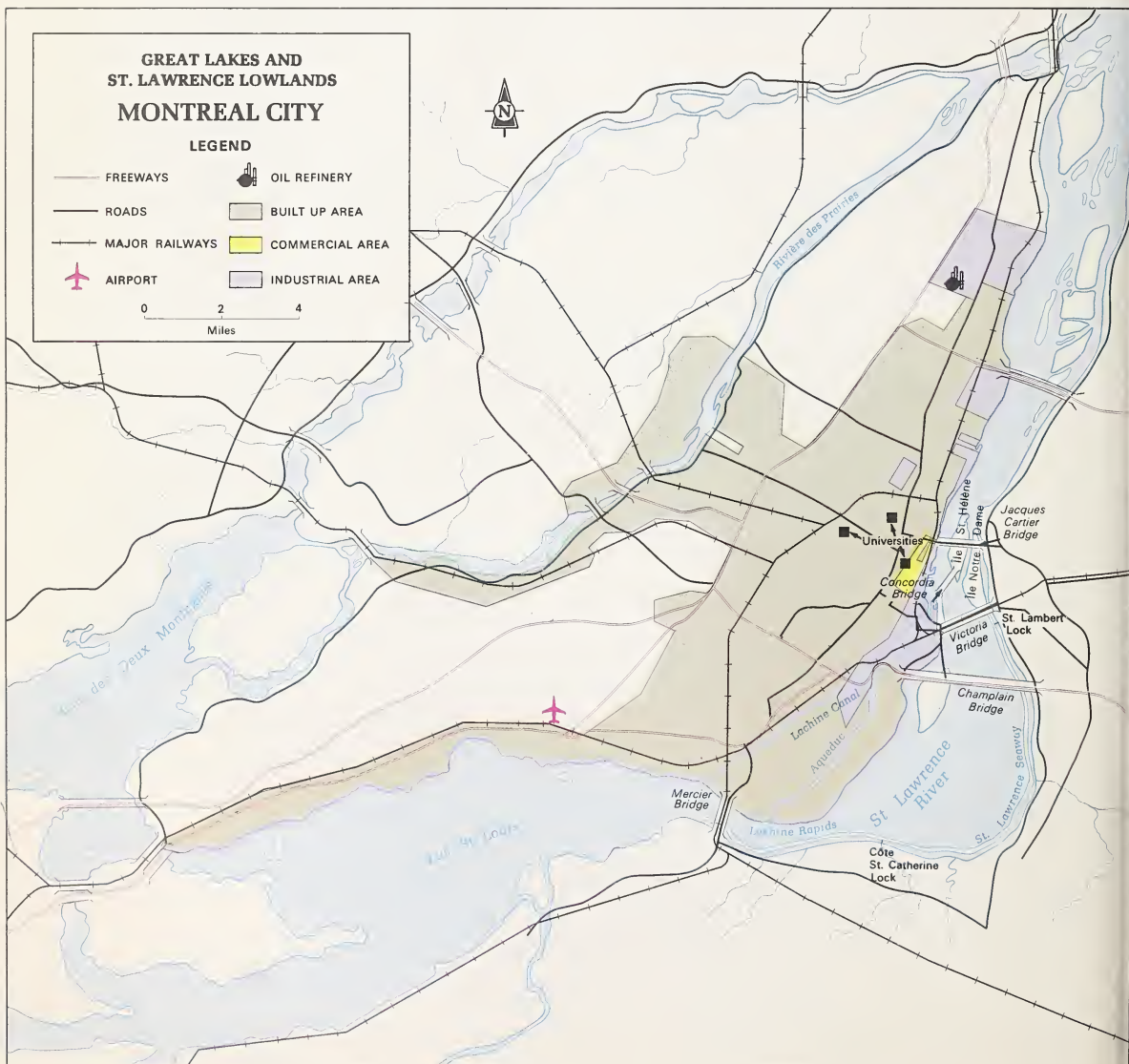
(a) summer vegetables, (b) dairy products, and (c) summer fruit?

2. Explain how Montreal, as Canada's leading garment centre, is affected by: (a) climate, (b) labour costs, (c) power, and (d) markets.

**G. Montreal's location in the valley of Canada's main waterway gives it access to many parts of North America**

1. Give at least four reasons to support this statement.

2. How far is it by water from Montreal to: (a) New York



Map 37

ty, (b) Toronto, (c) Ottawa, and (d) Quebec City?

Why is it an advantage that this harbour, which lies more than 1,000 miles inland, is not affected by tides?

**Climate, however, provides a serious handicap to this port.**

From the Figure 16, during what months is the harbour closed because of ice?

What other Canadian city could be a centre for trans-shipment during these months?

3. What type of vessel, other than freighters, is important to Montreal's economy?

4. Divide your page into three columns and title them Industry, Source of Raw Material, and Destination.

(a) Under the column Industry, list these important ones that are found in Montreal: (i) meat-packing, (ii) flour milling, (iii) oil refining, (iv) textile milling, (v) sugar refining and (vi) gypsum-processing.

(b) Complete the other two columns.

Map 38







**Montreal Harbour.** With the aid of Map 38, identify the piers in the centre of the photograph.

## GROWTH



**Urban Renewal**

**A. As populations increase and cities expand, many problems are created.**

1. State why each of the following is true:

- (a) As a centre grows in importance, its population increases.
- (b) People tend to move from the centre of the city to the suburbs and outer limits.
- (c) When crowded conditions occur in the suburbs, movement takes place back to the centre of the city.
- (d) The price of houses in the city becomes higher as the demand for them increases.
- (e) If not planned years in advance, city traffic becomes a serious problem.





## URBAN RENEWAL

1. The Urban Renewal picture shows different types of dwellings.

2. Apartments A and B were built to replace homes similar to those marked C.

3. What advantages are evident as the result of this renewal?

4. The apartments marked B were built later than those marked A. Suggest reasons for their greater height.

5. What effect might residence in large apartment buildings have on the tenants' way of life?

## RAPID TRANSIT

6. The letters on the photograph show:

7. Subway station. B. Covered subway overpass. C. Main traffic artery. D. Walkway.

8. In spite of the above, there is rush-hour traffic congestion.

9. What is meant by rush-hour traffic? When does it occur?

10. Suggest steps to alleviate this problem.

11. What is the purpose of covering the subway at the overpass?

## Rapid Transit

## DISAPPEARING ORCHARDS

12. Name two reasons, evident in the picture, for disappearing orchard land.

13. Suggest how the loss of farmland might be controlled.



## Disappearing Orchards





### SUBURBAN SPRAWL

5. Locate the suburban dwellings.
6. Why are the residential streets not laid out in straight lines?
7. Describe the land use to the right of the dwellings.
8. What are the advantages that encourage industry to locate outside the city?
9. Why don't people in suburban areas have to live near their place of employment?

### MAJOR INDUSTRIES

**D. In areas of large population and industry, pollution is of great concern to all.**

1. Tell what harm is done by each of the following, and suggest how the problem is being solved:

- (a) smoke from factories and ships.
- (b) fumes from cars, trucks, and buses.
- (c) industries permitting contaminated water to enter rivers and lakes.

**E. Some steel mills spend in excess of one million dollars a year combatting pollution.**

1. The following statements describe what is currently occurring in the Great Lakes and St. Lawrence Lowlands. State whether it is good or bad, and predict the possible outcome.

- (a) Orchard land is being used by industry.
- (b) Land is being reclaimed to enlarge harbour facilities.
- (c) Large woodlots are being completely destroyed for lumber.
- (d) New industries are being built in the suburbs.
- (e) Subways are being constructed in some Canadian cities.



Major Industries



## THE CANADIAN SHIELD REGION





Map 39

## GENERAL

### PHYSICAL ORIGIN

**A. Mountain ranges in the Shield were worn down by glaciers leaving the hardest and oldest rocks known to man exposed on the surface.**

1. Where did the glaciers come from, and in what directions did they advance?
2. What happened to the surface of the Shield as the glaciers pushed from hardrock into softrock areas?
3. Explain why there are innumerable lakes in the Shield Region.

4. Note the areas that were once covered by glacial lakes

- (a) What kind of soil would you expect to find in these areas?
- (b) Name one town located on the site of a former glacial lake.
- (c) What is it noted for?

**B. Large masses of land have risen out of the Arctic Ocean**

1. Describe their surface features.

**C. Although the Shield covers almost half of Canada, it is very sparsely populated.**





Map 40

1. Explain the small population in the southern parts of this Region.
2. How many miles does the Shield stretch from Kenora northward to the Arctic Ocean and from Lake Athabasca eastward to the tip of Labrador?
3. What name is given to the part of the Shield that crosses the St. Lawrence River into the United States?
  - (a) Name the state into which it extends.
  - (b) Name also the central states into which another part of the Shield extends.
  - (c) Name the group of islands in the St. Lawrence River that is part of the Canadian Shield.
4. What minerals are found in large amounts in the Shield Region?

## CLIMATE

5. What types of climate are found at: (a) Kenora, and (b) Yellowknife? (See page 12.)
6. What is meant by permafrost?
7. Where in the Shield is permafrost found?

## POPULATION

8. Judging from the names of the towns where did the early settlers in the Shield Region come from?
9. What were their chief occupations?

## TRADE, COMMERCE, AND INDUSTRY

10. Account for the importance of each of the following centres: (a) Goose Bay, (b) Thompson, (c) Elliot Lake, (d) Chibougamau, (e) Schefferville, (f) Manitouwadge, (g) Noranda, and (h) Sault Ste. Marie.





Map 41

11. Match the description in column B with the name in column A.

| A                            | B  |
|------------------------------|--|
| (a) Churchill                | —large deposits of copper and nickel.                                |
| (b) Steep Rock Lake          | —noted for hydro-electric power, aluminium, and pulp and paper.      |
| (c) Sept Îles                | —a salt water port for Manitoba.                                     |
| (d) Sudbury                  | —an important centre for power development on the St. Maurice River. |
| (e) Shawinigan               | —large grain elevators, an important harbour and rail centre.        |
| (f) Lake St. John Area       | —an area of large iron deposits supplying the Lakehead.              |
| (g) Fort William-Port Arthur | —a transshipment port for ore from the Quebec-Labrador area.         |

## RIVERS

**A.** The largest rivers of the Shield empty into one or other of four large bodies of water: the Arctic Ocean, Hudson Bay—James Bay, the St. Lawrence—Great Lakes system, or the Atlantic Ocean.

Name two major rivers that flow into each of the outlets named above.

**B.** A line can be drawn on a map to separate the rivers that flow into the Great Lakes—St. Lawrence River system from those that flow into Hudson Bay or James Bay.

1. If one end of the line is at the source of the Hamilton River, name the city on the Great Lakes at the other end of the line.

(a) What name is given to a line that divides rivers in this manner?



What name is given to the area that is drained by a river system?

Why do some rivers flow into Hudson Bay or James Bay, whereas others flow into the St. Lawrence River?

Why does the Mackenzie River flow northwest into the Arctic Ocean and not east into Hudson Bay?

With the aid of a relief map, compare the speed at which the rivers might flow into: (a) Hudson Bay from the west, (b) Hudson Bay from the south and east, (c) the St. Lawrence River from the north, and (d) the Atlantic Ocean from the west.

**Although its rugged nature was a barrier to the development of Canada, the Shield proved to be extremely important to the country's economy.**

Why would fur traders be eager to obtain animal pelts from the northern part of this Region?

(a) How did this stimulate exploration?

What means of transportation was used by the early explorers and traders?

(a) What characteristics of the Shield made this the best way to travel?

3. Outline a water route from Port Nelson to Winnipeg.

4. How does climate affect overseas trade with this part of the Region?

5. How did the surface of the Shield influence the building of roads and railways?

(a) How did it influence settlement?

(b) Does it have the same effect on transportation and settlement today?

**D. To meet increasing demands, more and more of Canada's forests are being cut down.**

1. What part does the Canadian Shield play in relation to Canada's forest industry?

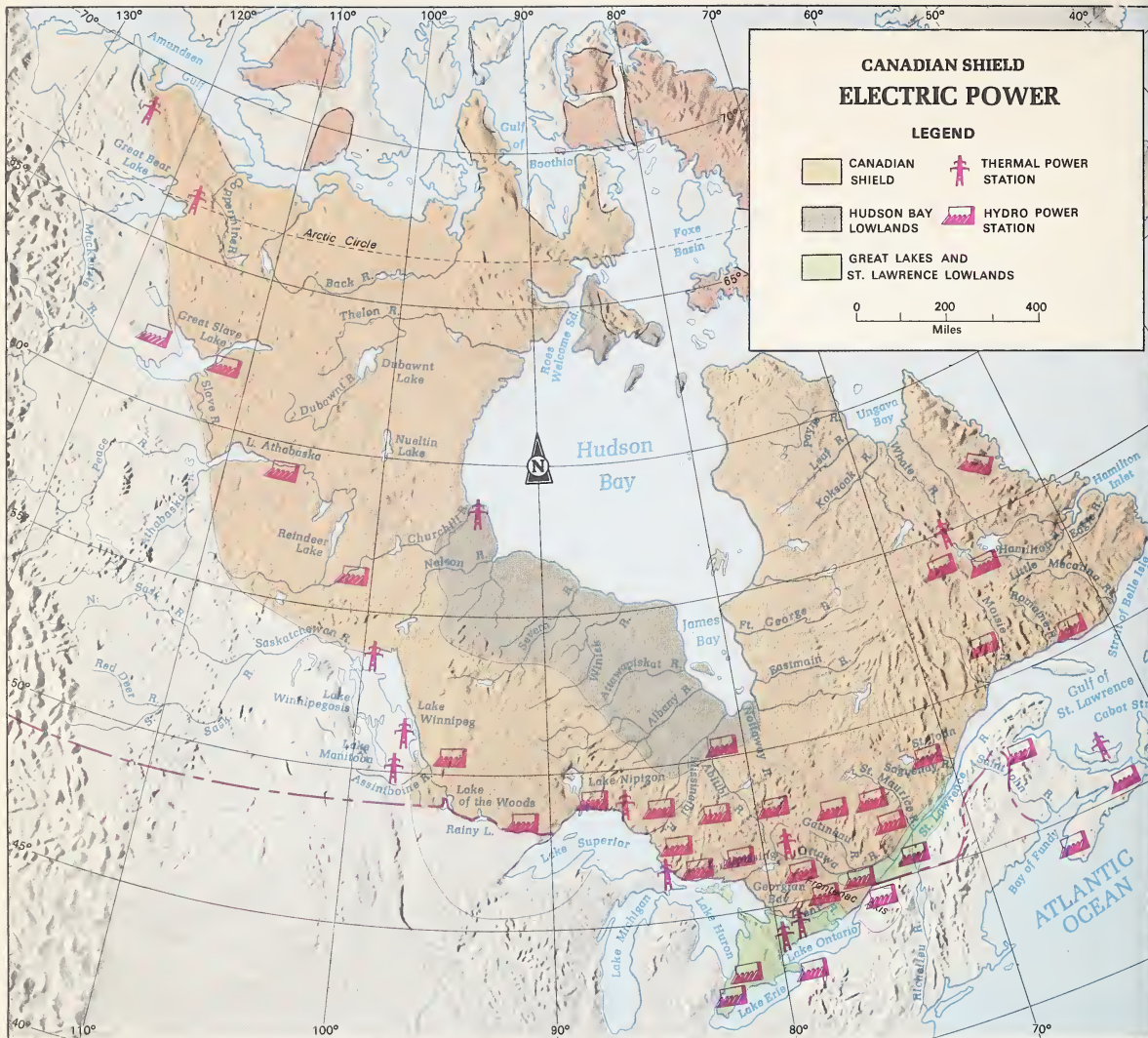
2. What is one of the main uses of timber today?

3. Name two other natural resources found in the Shield that are important to Canada.

4. From the names of the various bodies of water, which general areas were explored by the British, and which by the French?







Map 42

## HYDRO-ELECTRIC POWER

**A. Three main reasons for the Canadian Shield being a great producer of hydro-electric power are its: (1) surface relief, (2) climate, and (3) vegetation.**

1. How does the rugged surface of the Shield affect the production of waterpower?
2. Explain why there is more hydro-electric power produced in the eastern than in the western part.

**B. The graphs for three centres in the Shield show a fairly even and abundant distribution of rainfall.**

1. What else do the climatic graphs tell us about rainfall to suggest that there is a fairly even flow of water in the rivers during the year?
2. Why is an even flow of water necessary for the satisfactory production of hydro-electric power?

3. Explain how the forests of the Shield Region help prevent: (a) floods, and (b) erosion.

4. What are the two chief manufacturing industries of the Shield?

5. Name the river systems from which the following centres obtain their power for industry: (a) Sudbury, (b) Sault Ste. Marie, (c) the Lakehead, and (d) Timmins.

**C. Large thermal-electric power plants are being built at Fort William because there is not sufficient waterpower available in the area to supply future needs.**

Which of the three requirements for the successful development of waterpower, suggested above, are lacking in this area?

## CLIMATIC GRAPHS

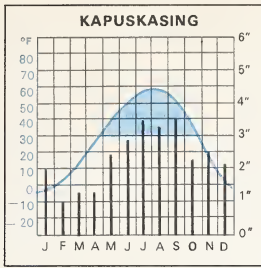


Figure 28

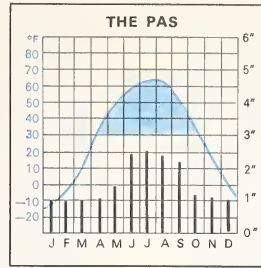


Figure 29

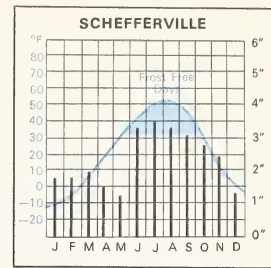


Figure 30

Quebec produces about half of Canada's waterpower.

Which of the three requirements is chiefly responsible?

Name the river systems that supply the following areas with power: (a) Montreal, (b) Eastern Townships, and (c) Quebec City.

Are the cities of southern Ontario closer to sources of hydro-electric power than those in southern Quebec?

Give reasons for your answer.

Why have not more rivers in the northwestern part of the Shield been developed for power?

How does the abundant hydro-electric power of the Shield affect the cost of: (a) producing paper, (b) buying newspapers and magazines, (c) producing steel and other metals, (d) buying metal products, and (e) heating and lighting homes?

From the Profile of the St. Maurice River, what clues can you find that this river flows through the Shield Region?



Hydro Reservoir in the Shield.

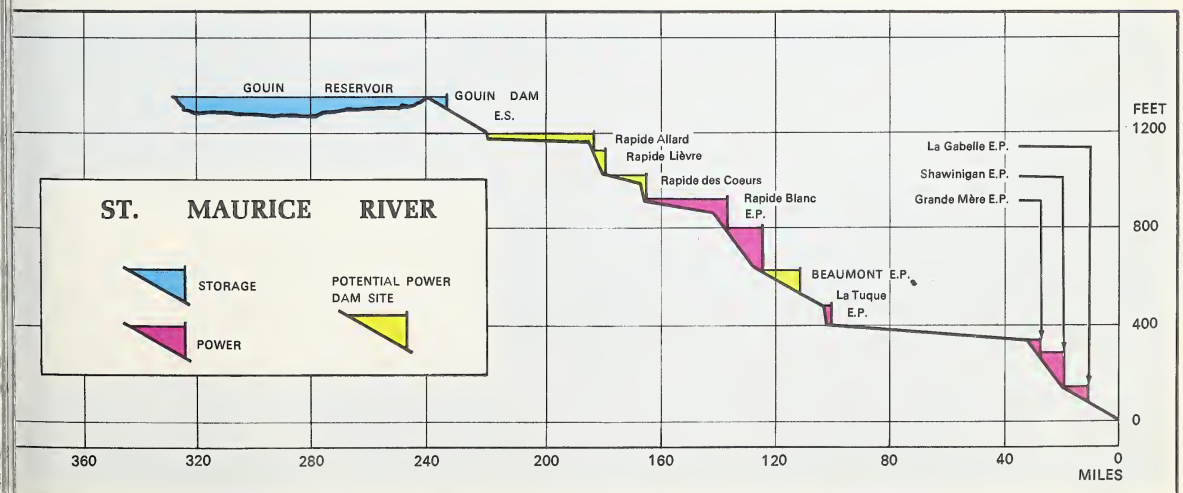


Figure 31 — Profile Diagram of the St. Maurice River



## MINING

**A. The Canadian Shield is often referred to as the miner's storehouse of Canada.**

1. On a large-scale map of the Shield Region:

(a) Make a legend for gold, silver, copper, nickel, uranium, iron ore, and railways.

(b) Using the symbols, mark on the map the areas where minerals are found.

(c) Print the names of the places where the minerals are found.

(d) Plot the railway lines and mark those that were constructed especially to serve mining areas.

(e) Show by dotted lines the routes taken by ships carrying iron ore from Sept Îles and Fort William.

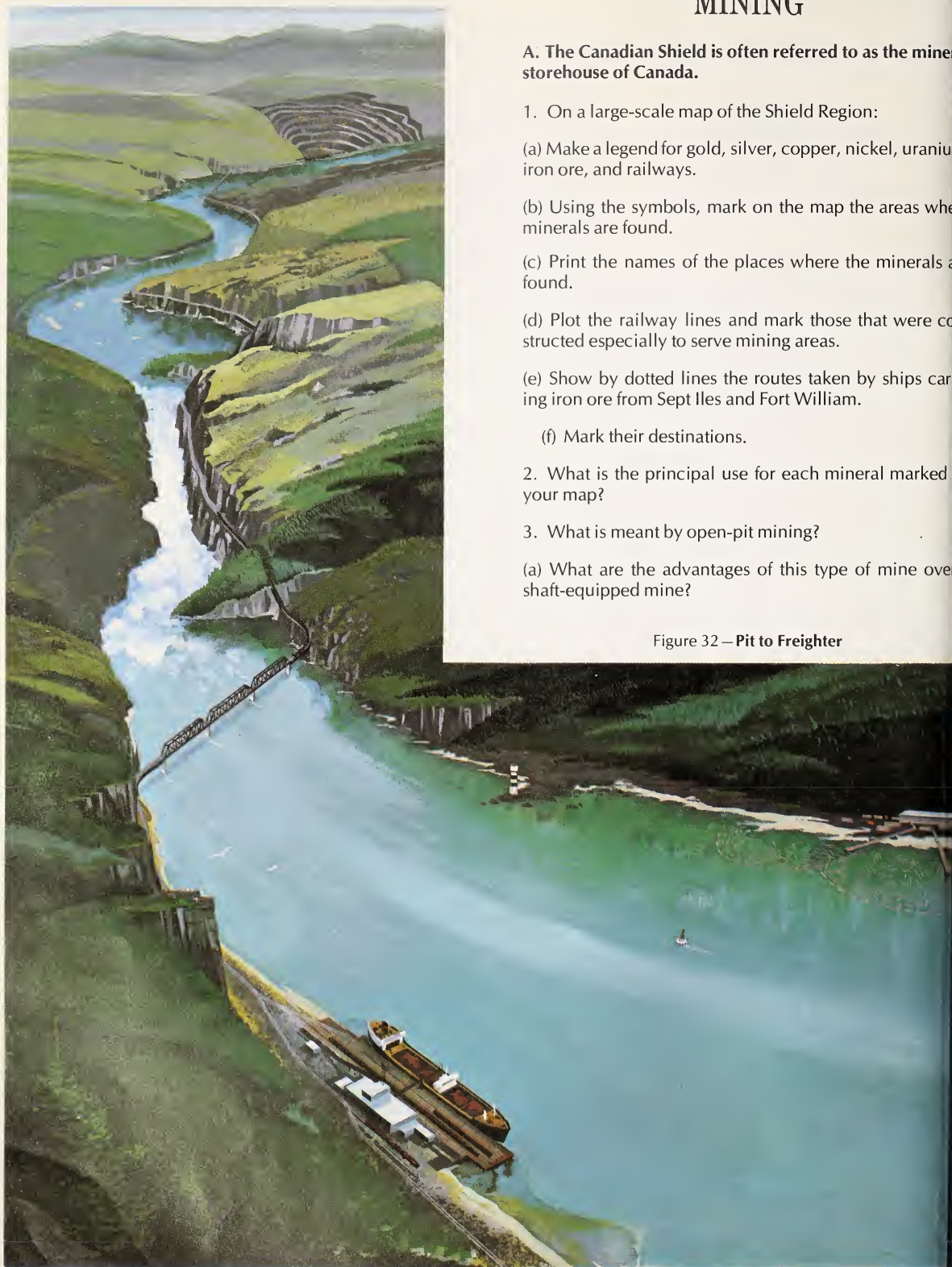
(f) Mark their destinations.

2. What is the principal use for each mineral marked on your map?

3. What is meant by open-pit mining?

(a) What are the advantages of this type of mine over a shaft-equipped mine?

Figure 32 — Pit to Freighter







**Ore Train.** Why are the ore cars enclosed?



**Loading Ore**

What special feature of the Shield makes open-pit mining possible?

Name two large open-pit mines in the Shield.

**Before beginning the development of a new mining area, there are many factors to be considered by the operator.**

As a mine operator, what would you want to know about each of the following before judging whether or not your mine could operate successfully: (a) location, (b) geology, (c) water supply, (d) power supply, (e) market, (f) climate, (g) timber, (h) labour supply, and (i) food supply?

2. Why has there been more mining development in northern Ontario than in northern Quebec?

3. Why were railways serving the eastern part of the Shield built along the St. Lawrence estuary and not from a port on Hudson Bay?

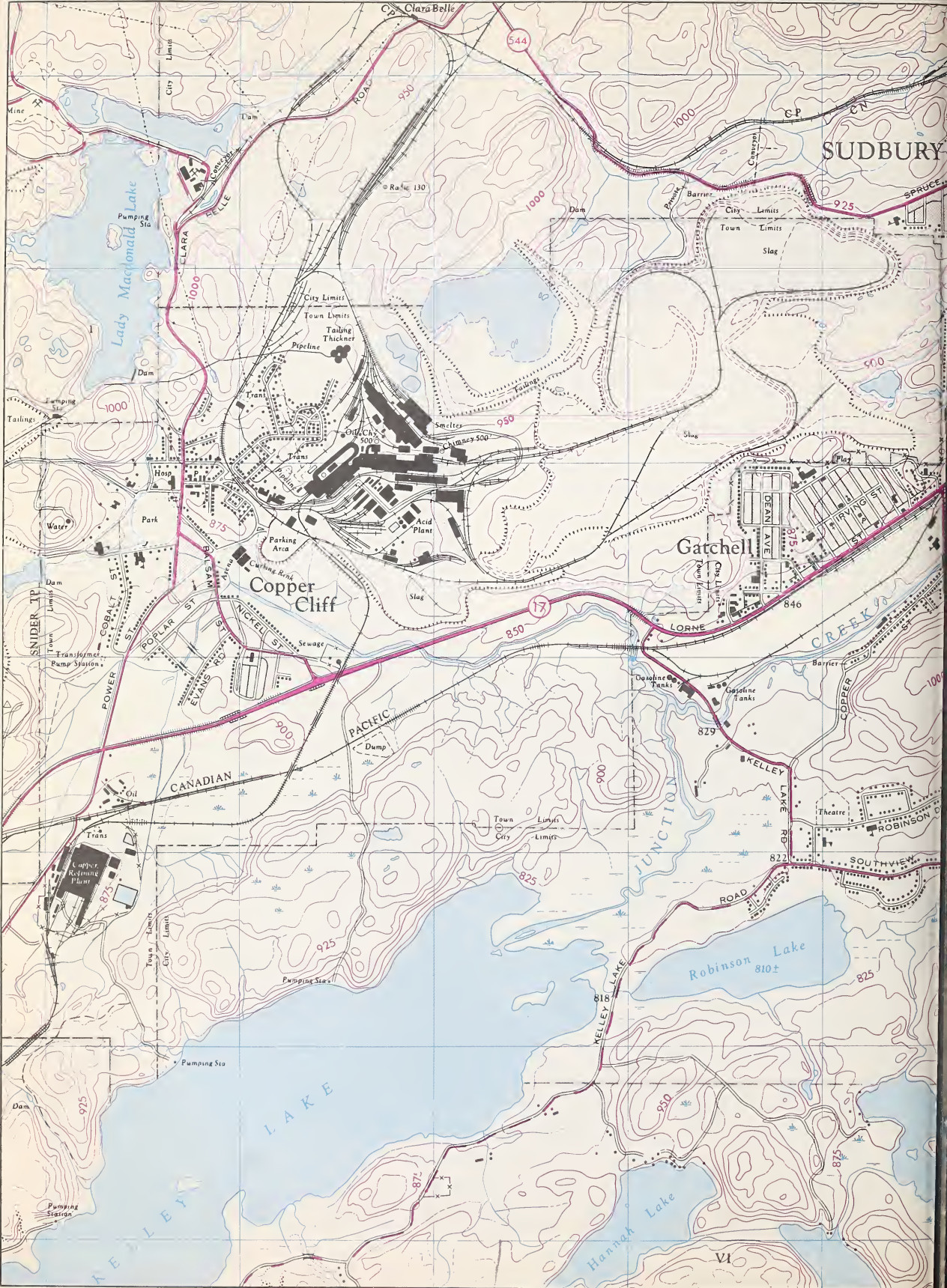
4. Why have some mining towns, once thriving communities, become "ghost" towns?

5. From the photographs, the artist's sketch, and the map you made for question A1, explain how iron ore from Schefferville reaches blast furnaces at Hamilton.

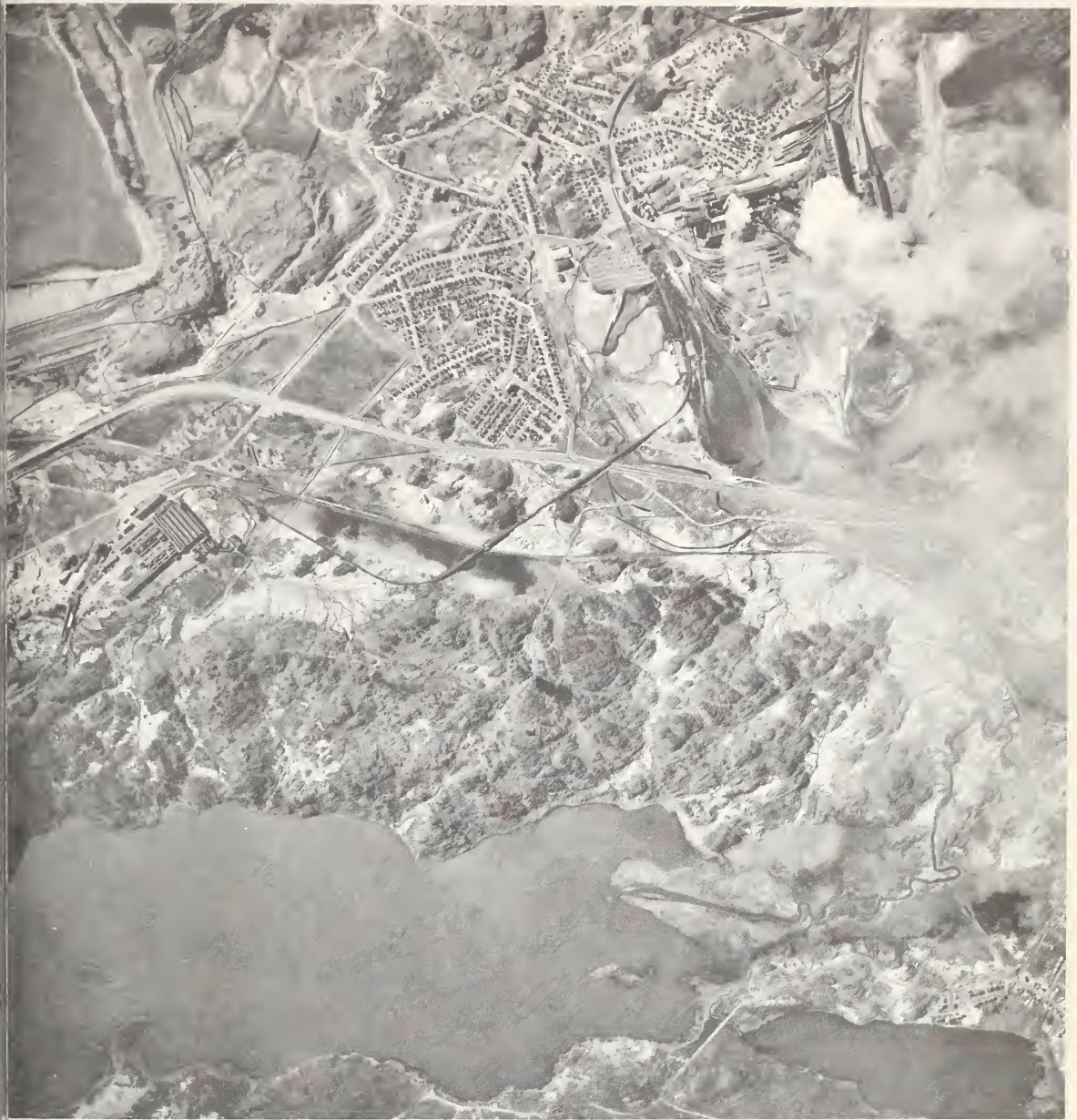
**Open-Pit Mining.** Account for the terraces.











Vertical Aerial Photograph of the Copper Cliff Area

## COPPER CLIFF

One of the largest smelters in the world is located at Copper Cliff.

### FROM THE MAP AND AERIAL PHOTO

Locate the main smelting plant.

Why are there so many railway lines in and about Copper Cliff?

Locate the slag and the tailings areas.

Differentiate between slag and tailings.

4. Notice the general lack of vegetation in this area

(a) Why is this so?

(b) What steps were taken to overcome this situation?

5. What characteristics of the Shield are evident from the map?

6. Explain the relation that exists between Highway 544 and the contour of the land.



## THE LAKE ST. JOHN AND SAGUENAY RIVER AREA

**A. The Saguenay River flows through some of the most beautiful country in Canada. Tadoussac at its mouth was the first trading post in Canada.**

1. Locate Lake St. John and the Saguenay River on the map.

(a) What direction is Lake St. John from Quebec City?

(b) How many miles would an airplane fly when travelling from St. Félicien to Quebec City?

(c) Into what river does the Saguenay River flow?

**B. Port Alfred is a transshipment point for raw materials and manufactured goods entering and leaving the area.**

1. Why don't ships sail directly to important centres farther up the river?

2. Examine the photograph and Map 44 and describe the landscape surrounding the river valley.

3. With a clue from the climatic graph for St. Félicien name one important use of the rivers in this area.

**C. The soil of the lowlands surrounding Lake St. John is a rich clay.**

1. Account for this. (See Map 39.)

2. Why is the climate suitable for farming in the Lake St. John area?

**D. One third of the 260,000 people in the Lake St. John-Saguenay River area work on farms.**

Where do they market their crops?



Aluminium plant at Arvida

, Dairy products, poultry, and potatoes are very important commodities.

What discourages farmers from producing more than can be used locally?

What employment can the farmers of this area find during the winter months?

Name the chief centres for pulp mills in this area.

Why is cheap electricity necessary in the production of pulp and paper?

What natural feature, common to most of the Shield, makes this industry possible?

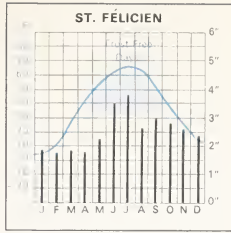


Figure 33 — Climatic Graph

#### F. Soils of the Shield are generally thin.

1. What trees, used for pulp, thrive under such conditions?

2. What work is done in this area during the winter months?

#### G. Manufacturing is the leading industry of this area. One of the world's largest aluminium smelters is located here.

1. Name four ways in which aluminium is used in your home.

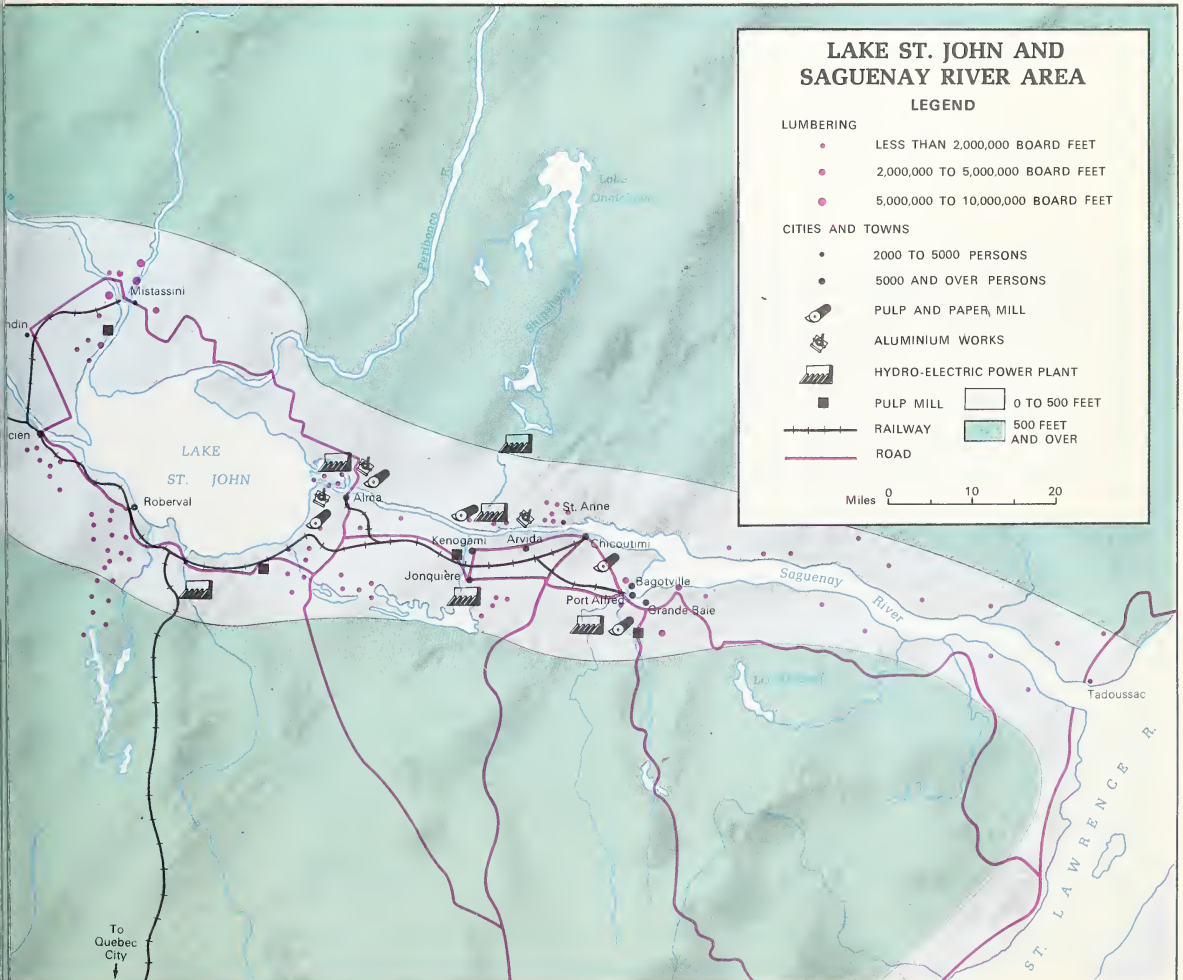
2. What qualities make aluminium a useful metal?

#### H. It requires as much electricity to produce 1 ton of aluminium as would be used in 1 day by a town of 30,000 people.

Considering this, why was Arvida established as the site for an aluminium smelter?

#### I. The ore of aluminium is bauxite.

Where does bauxite come from?





**J. Cryolite and fluorspar are other raw materials needed for the production of aluminium.**

Where do these come from?

**K. Seven tons of raw material makes one ton of aluminium.**

1. Why must raw materials used at Arvida be stockpiled during the summer season?

2. What forms of transportation are used during the winter months to export from Arvida?

3. Tell how each of the following has contributed to make the smelter at Arvida one of the world's greatest producers of aluminium: (a) labour, (b) water power, (c) transportation, and (d) farming area.

4. List the above in order of importance in respect to the production of aluminium.



Port Alfred

## FOREST PRODUCTS

**A. Find a map of the Shield that shows the locations of forest industries.**

1. What industry is suggested by the term board feet?

2. Explain the difference between a pulp mill and a paper mill.

3. What physical and climatic features of the Shield are responsible for the extensive forests?

4. Why are forest industries generally located south of the 55th parallel of latitude?



River of Logs

Trees in the northern part of the Shield are smaller than those in the south.

What climatic factors restrict the growth of trees in the north?

What do the locations of all pulp and paper mills have in common?

Define: taiga, "land of little sticks", tree-line, tundra, deciduous trees, and coniferous trees.

Although there are many rivers in the Shield, only a small number of these are suitable for transporting logs.

Why is this so?

From the photograph of the mill find out:

why a water location is necessary.

from what direction the logs are travelling to the mill.

how many piles of pulpwood are stacked to the right of the mill.

by what means the product of the mill is transported to market.

what evidence there is that large quantities of paper are produced at this mill.



Forest

3. If you were locating a site for a pulp mill, what four important requirements would you have to consider?
4. What kinds of trees are used in making pulp and paper?
5. Why is cutting done during the winter?
  - (a) How are the trees cut?



Log Boom





Mill

6. When are the logs moved from the forest to the mill?

(a) Describe how this is done.

7. What is meant by overcropping?

8. What measures are taken by mill operators to insure a steady supply of pulpwood?

**D. Newsprint is Canada's largest export.**

1. What is newsprint used for?

2. What country buys most of this export?

**E. The chief enemies of the forest are people, fire, and certain insects.**

What is being done to reduce forest losses due to the above?



Consumer





## RECREATION

**No other country in the world has such a vast expanse of playground and vacation land.**

What valuable industry is suggested by the accompanying pictures?

Locate areas of the Shield where these pictures might have been taken.

How do the types of trees shown in the hunting picture suggest that this is the southern rather than the northern part of the Shield?

Why do many people from the United States visit this area during the summer?

Calculate the distances, by road, from New York to North Bay, and from Detroit to North Bay.

Why is the summer weather better in this area than Florida?

From the hunting photograph, how do you know what season of the year it is?

Name two large forest animals that inhabit the Shield.

Name two small animals that are hunted in the Shield.

**B. Marshes and lakes provide a home for two types of waterfowl that are hunted in the Shield.**

1. What are these two types?
2. What measures has the Government taken to protect its wild animals?

**C. The winter picture shows the southern part of the Shield in Quebec.**

1. What evidence suggests that it is Quebec?
2. What name is given to the part of the Shield just north of Montreal?
3. What kinds of trees are most common in this area?
4. Name four physical characteristics of the Shield that are indicated in the fishing photograph.

**D. The waters of the Shield abound in many species of game fish.**

1. Name three different species.
2. In what ways do tourists provide income for many people who live in the resort areas?
3. What could you do to make tourists want to return to this vacation land if you were: (a) living in a resort area or (b) another tourist?





Trading Post—White Man's Influence.

## HUDSON BAY—JAMES BAY LOWLANDS

### A. This Region is an area emerging from the water.

1. On a large-scale map of the Hudson Bay—James Bay area, mark the following:

- (a) The Lowlands area.
- (b) Towns: Moosonee, Fort Albany, Attawapiskat, Fort Severn, Port Nelson, and Churchill.
- (c) Rivers: Missinaibi, Albany, Attawapiskat, Severn, Nelson, and Churchill.
- (d) The tree-line.

2. Account for: (a) the flat, poorly drained surface of this Region, (b) the settlements being along the coast and at the mouths of rivers, (c) the lack of roads, and (d) the northward flow of the rivers.

3. On a single page, make four climatic maps of the Lowlands showing: (a) average January temperatures, (b) average July temperatures, (c) average annual rainfall, and (d) average length of frost-free season.

4. From the climatic maps, answer the following questions:

- (a) What is the annual rainfall at Fort Severn?
  - (b) What is the average July temperature at Churchill?
  - (c) What is the average January temperature at Moosonee?
  - (d) What is the average length of the frost-free period for this area?
5. Judging from the location of the settlements, how do you think the inhabitants make their living?
6. What do names such as Attawapiskat suggest about the ethnic origin of the early inhabitants of this area?

### B. Names such as Fort Severn and Port Harrison indicate the origin of another people who settled on these shores.

- 1. Where did these settlers come from?
- 2. Where is permafrost found in this Region?
- 3. What type of vegetation is found in the tundra area?
- 4. What is the latitude of Moosonee, and Churchill?
- (a) Calculate in miles, how far each centre is north of Toronto.



## THE APPALACHIAN REGION





Map 45

## APPALACHIAN REGION

**A. The nature of the Appalachian Region barred many of the early settlers from travelling overland to the interior.**

1. In what direction do the Appalachians extend from the southern United States?
2. Describe the land surface of the coastal area as shown in the photograph.
3. If you had been one of the original settlers in this area, what occupation might you have chosen?
4. From the names of places, determine the nationality of the settlers of: (a) the Eastern Townships of Quebec, (b) the Gaspé Peninsula, and (c) the Atlantic Provinces.

**B. In the Eastern Townships, settlements are evenly distributed over the entire area, whereas in the Gaspé Peninsula and Atlantic Provinces, the settlements are near the coast.**

1. Account for the two different patterns of settlement.
2. Why is the construction of roads expensive in the Appalachian Region?

3. To which Canadian province do the Eastern Townships and the Gaspé Peninsula belong?

4. Match the ending of each sentence in column B with the proper beginning in column A. Tell whether each sentence describes the Eastern Townships, the Gaspé Peninsula, or both.

A

B

- |   |  |
|---|--|
| (a) The chief crop of the long narrow farms is    | — mined near Thetford Mines                          |
| (b) Maple trees are                               | — to encourage a large tourist industry.             |
| (c) Sawmills, flour mills, and textile mills were | — mined at Murdochville.                             |
| (d) Herring, lobster, and salmon are              | — tapped for syrup in the spring.                    |
| (e) Canada's second largest deposit of copper is  | — hay for dairy cows.                                |
| (f) Most of the world's supply of asbestos is     | — developed on sites where waterpower was available. |
| (g) Seasonal sports help                          | — sold fresh in cities of southern Quebec.           |



Rugged Coastline

## EASTERN TOWNSHIPS

Montreal is the "Gateway to the Eastern Townships".

From a map:

Estimate its distance in miles from Montreal.

Describe the relief of the land.

What language is mostly spoken here today?

From the photograph of the sugar bush:

What important product of this area is suggested?

At what time of the year is this product collected?

With the aid of the climatic graph of Sherbrooke, explain why hay is the chief agricultural crop.

Where does this area rank in Canada's production of butter and milk?

6. What species of livestock are important sources of income for farmers in this area?

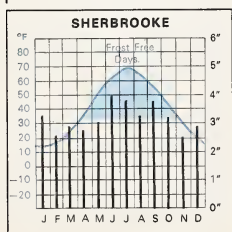


Figure 34 — Climatic Graph



Sugar Bush





Map 46

## ATLANTIC PROVINCES

### POSITION AND EXTENT

**A.** Millions of years ago the shape of North America was quite different from what it is today. Since that time, parts of it have risen out of the sea, and other parts have sunk beneath the sea. It is believed that the Hudson Bay Lowlands are gradually rising, proof being the smooth coastline, the relatively flat terrain, and the poorly drained surface.

1. From the map, what evidence is there that eastern Canada is slowly sinking?

2. If the land has sunk 500 feet in the last 1,000,000 years, draw a map to show how the area might have looked that long ago. Shade the lowlands (0–500 ft.) light green, the middlelands (500–1,000 ft.) yellow, and the highlands (over 1,000 ft.) orange. (Refer to map 45).

(a) How far did the St. Lawrence River then extend?

(b) At that time, what was the geographical form of the island of: (i) Anticosti, (ii) Newfoundland, (iii) Prince Edward Island, and (iv) Cape Breton Island?

(c) At that time, what were the following bodies of water: (i) Strait of Belle Isle, (ii) Northumberland Strait, (iii) St. Lawrence River, and (iv) Bay of Fundy?

3. If, in the next 1,000,000 years, the land sinks another 500 feet, what will this area look like?

(a) Draw a map to illustrate your answer.

(b) What will happen to: (i) Prince Edward Island, (ii) Nova Scotia, and (iii) the St. Lawrence River?

4. What similarities will there be between the St. Lawrence River of the future and the St. Lawrence River of the past?

5. Explain why people in the Atlantic Provinces see daylight before people on the Prairies.

(a) When it is 9.00 a.m. and time for school in Halifax, what time is it in Edmonton?

(b) When meals are being prepared at 5.00 p.m. in Vancouver, what time is it in St. John's?

The Atlantic Provinces can be contained roughly by lines drawn between Cape Chidley, Cape Sable, and St. John's.

On a map, join these three points by straight lines.

What are the latitudes and longitudes of these three centres?

How many air miles is it between: (a) Cape Chidley and Cape Sable, (b) Cape Sable and St. John's, and (c) St. John's and Cape Chidley?

Compare the north-south extent of this area with that of Quebec.

Which is the greater?

Compare the east-west extent of this area with that of northern Ontario.

Which is the greater?

What occupies most of the part of the triangle that lies between Lat. 45°N. and Lat. 50°N., land or water?

## BARRIERS

It may be said that four "barriers" isolate the Atlantic Provinces from the rest of Canada: water, distance, land, and frontier.

### WATER

Name the major bodies of water through which a ship travels from St. John's to Montreal.

Using the scale of miles, calculate the distance along the route you have selected.

At an average speed of 20 miles an hour, how long will the voyage take?

### STANCE

From a road map, select the shortest route you would take in driving a transport truck from Halifax to Toronto.

Calculate the distance.

How does this distance affect the price of manufactured goods shipped from the Toronto area?

### LAND

Through what land barrier does the most direct route from central Canada pass?

Describe the type of road found in this area and its effect on transportation.

## FRONTIER

4. What state of the U.S.A. lies west of New Brunswick?

(a) How does it isolate the Atlantic Provinces from the rest of Canada?

5. Which Atlantic province is suggested by each of the following descriptions: (a) Canada's smallest province, (b) a peninsula and an island, (c) largest province, (d) most western province, (e) lowland, entirely under 500 feet, (f) highlands on the west coast?



Can you identify this port city?

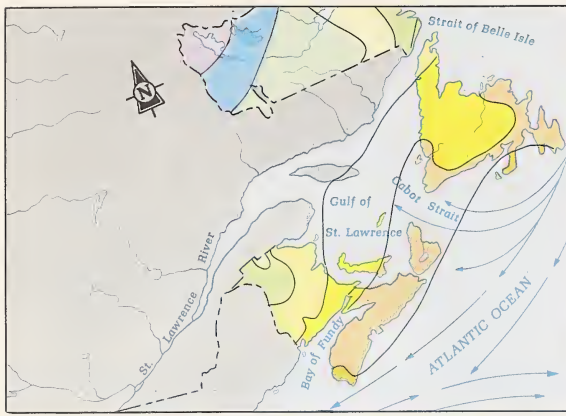
6. Make up your own question about each of the following: (a) Bay of Fundy, (b) Labrador, (c) Nova Scotia, (d) the harbours, (e) distance.

7. If the Atlantic Provinces united into a single province, which city would you choose for its capital?

(a) Give reasons for your choice.

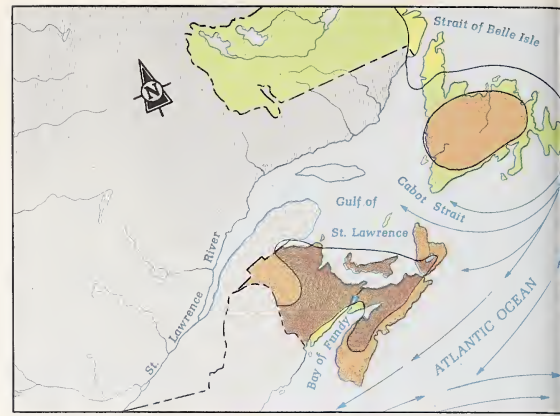
(b) Consider the "pros" and "cons" of such a union.





BELOW -10° -5° 0° 5° 10° 15° 20° 25° OVER

Map 47 — Average January Temperature (°F.)



BELOW 55° 60° 65° OVER

Map 48 — Average July Temperature (°F.)

## CLIMATE

**A. The climate in the Atlantic Provinces varies according to location.**

### TEMPERATURE

1. Why are the highest winter temperatures found along the south coast of Newfoundland, and of Nova Scotia?

(a) What is the average January temperature here?

(b) Why is this area warmer than inland places of the same latitude?

2. Why is it warmer at St. John's than at Fredericton?

3. Using Maps 45 and 47 find an example of how altitude affects temperature.

4. What is the average January temperature at Halifax?

(a) Compare this average January temperature with that of where you live.

(b) Account for the fact that the harbours of Maritime shipping ports do not freeze during the winter.

5. Why are the lowest summer temperatures found along the coasts?

6. How do temperatures change as one goes inland from the sea? Why?

7. How do the highlands affect temperatures?

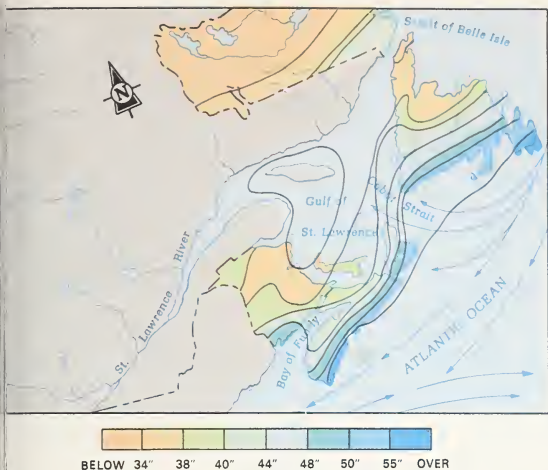
8. Where would you expect to find the highest temperatures in this Region?

(a) Give two reasons for your answer.

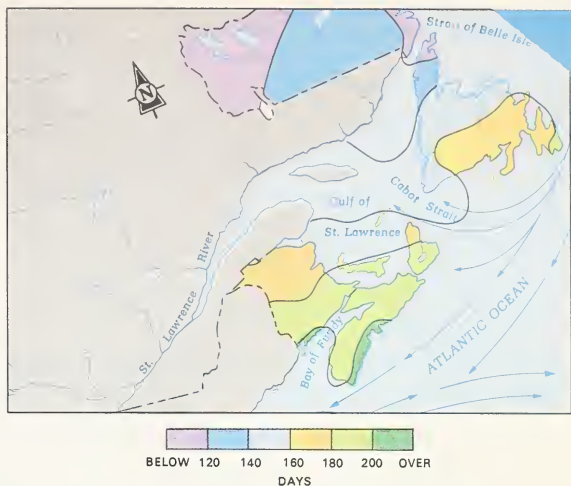
9. What is the average July temperature at Halifax?

(a) Compare this with the average July temperature where you live.

(b) What is the temperature range at Halifax?



Map 49 – Precipitation



Map 50 – Growing Season

## PRECIPITATION

**More rain falls in the Appalachian Region than in most other parts of Canada.**

What areas have the most precipitation?

Account for this.

How does the amount of precipitation change as one moves inland from the south coast?

How does the amount of precipitation in this Region affect: (a) farming, (b) forest industries, (c) hydro-electric development?

What other factors have an important influence upon: (a) farming, (b) forest industries, (c) hydro-electric development?

Compare the annual precipitation of Halifax with that where you live.

6. How does each of the following affect the length of the growing season: (a) latitude, (b) nearness to large bodies of water, (c) height of land?

7. From a study of Maps 47 and 49 where would you find the least snow?

(a) Explain why.

## GROWING SEASON

**C. The east coast of the Avalon Peninsula has a shorter growing season than the area immediately to the west.**

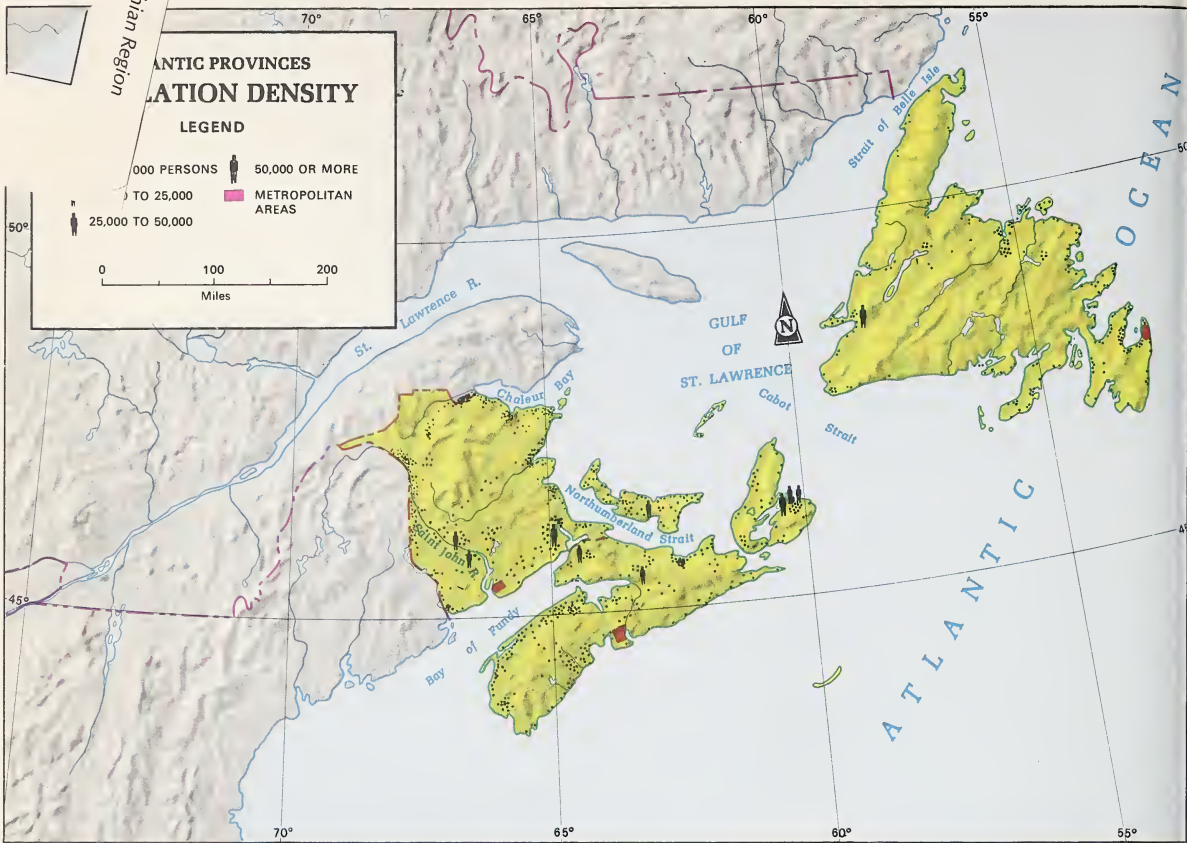
1. Explain why.

2. Compare the length of the growing season of the Annapolis Valley with that of the: (a) Niagara Peninsula, (b) St. Lawrence Lowlands, (c) Lake St. John area.

3. Name the two ocean currents that affect the climate of the Atlantic Provinces.

(a) In what way do these two currents cause fog?





Map 51

## PEOPLE

A. Labrador, which belongs to Newfoundland, is part of the Canadian Shield. The Atlantic Provinces belong to another physical Region.

1. To what Region do the Atlantic Provinces belong?  
(a) Describe the varied land surface of this Region.

2. Which province has the most even population distribution?  
(a) Account for this.

3. Why is an irregular coast suitable for the establishment of fishing villages?



. Why is the population of Nova Scotia greatest along its coast?

. List some activities that might attract people from the coastal areas to the interior.

. **New Brunswick has three kinds of relief: lowlands, plateaus, and highlands.**

. What occupation attracts most people to the coast?

. What occupation attracts many people to the river valleys?

. Name the river valley that has the largest population.

. What parts of Newfoundland, Nova Scotia, and New Brunswick contain very few people?

. Account for this.

. Name the three largest cities in the Atlantic Provinces.

. **The five accompanying photographs suggest several occupations.**

. Where in the Atlantic Provinces might each be carried on?

. **The rivers of this region are quite short.**

. Explain why.

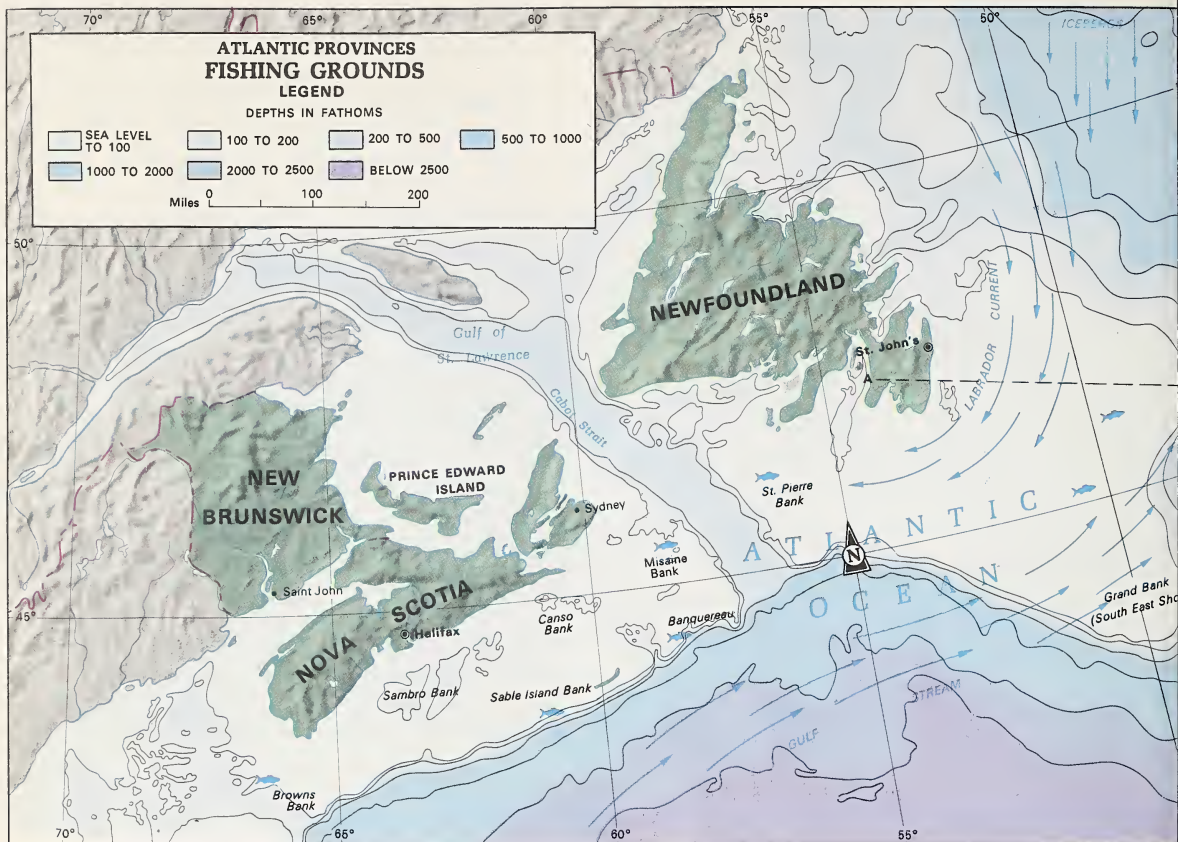
. Account for the constant and abundant flow of water in these rivers.

. Because of the rugged land surface, what use is made of these rivers?

. If you were to pioneer in this area, what factors would you consider in choosing a place for settlement?







Map 52



Figure 35 — Profile of the Continental Shelf between Points A and B on the Accompanying Map

## FISHING

**A. Fishing and shipbuilding have always been important industries in the Atlantic Provinces.**

1. Why did the first settlers look to the sea for their livelihood rather than to the land?

2. Of what value were the forests to the early boat builders?

(a) What changes have occurred in the construction of fishing vessels?

(b) What town in Nova Scotia is noted for its shipbuilding?

(i) What famous schooner was built there?

(ii) From what country did the first settlers of the town come?

**B. A number of natural conditions makes the waters of Canada's east coast the world's best fishing grounds.**

1. How do scientists explain the presence of the Continental Shelf?

(a) What is the average depth in fathoms, and in feet, to the shelf?

(b) What is the average depth to the ocean floor beyond the shelf?

c. **Sunlight, which is necessary for plant growth, can penetrate water to a depth of only a few hundred feet.**

d. **Why is the continental shelf suitable for plant growth?**

a) **What is plankton?**

b) **What effect have the Gulf Stream and the Labrador Current on water temperature?**

d. **Plankton thrives in the cool waters off Canada's east coast.**

e. **Why does plankton not grow well north of Newfoundland or south of Boston?**

f. **Two main types of fishing are inshore fishing and offshore fishing.**

g. **Make a copy of the following table and complete the columns.**

| TOPIC                   | INSHORE FISHING | OFFSHORE FISHING |
|-------------------------|-----------------|------------------|
| Distance from Shore     |                 |                  |
| Type of Boat            |                 |                  |
| Number in Crew          |                 |                  |
| Type of Fish Caught     |                 |                  |
| Method of Catching Fish |                 |                  |
| Weight of Catch         |                 |                  |

h. **Draw three maps of the Atlantic Provinces. Title the first map Limits. Using your map scale, draw a line 10 miles at sea from the coasts to indicate the inshore limits.**

i. **Shade the limits of the inshore fishing area yellow.**

(b) **Mark the extent of the continental shelf.**

(c) **Shade the limits of the offshore fishing area blue.**

(d) **Shade the major fishing banks red.**

(e) **Make a suitable legend for your map.**

3. **Title the second map Fisheries. Using suitable symbols, plot the locations of the following fishing grounds: lobster, cod, herring, salmon, and haddock.**

(a) **Why is it possible for many lobster fishermen to be farmers as well?**

(b) **How are lobsters caught?**

**F. Much of the lobster catch is sent live to American and Canadian cities.**

1. **What city is the centre of the lobster industry?**

2. **Name three means that are used in netting fish.**

3. **Explain the operation of each method.**

4. **Where is the largest fish cannery in the Atlantic Provinces?**

**G. Other important fish are sardines, tuna, mackerel, and halibut.**

1. **What methods are used to preserve the fish that must be kept on board ship for several days?**

2. **Why is it not practical for ships to return daily with their catch?**

3. **What electronic instruments are used to locate large schools of fish?**

4. **Title the third map Processing Plants. Using a suitable symbol, plot their locations on the map.**

**Dragger** en route to fishing grounds.



**Fish Nets** out to Dry







Lobster Traps in Readiness

**H. Often more fish are caught than can be marketed fresh.**

List four ways in which fish are processed.

**I. Because of the abundance of fish, boats from many countries fish off Canada's east coast.**

1. From what countries do they come?
2. How does this affect Canada's sale of fish?

**J. Many of the foreign fishing fleets process their catch at sea.**

Explain how this is done.

| PROVINCE<br>(1963) | PERSONS<br>EMPLOYED | FISH LANDED<br>(IN POUNDS) | VALUE OF ALL<br>FISH PRODUCTS |
|--------------------|---------------------|----------------------------|-------------------------------|
| Newfoundland       | 18,756              | 594,961,000                | \$43,793,000                  |
| Nova Scotia        | 12,578              | 429,016,000                | 76,809,000                    |
| New Brunswick      | 6,024               | 234,888,000                | 33,350,000                    |
| Quebec             | 6,024               | 132,773,000                | 9,043,000                     |
| British Columbia   | 15,456              | 772,859,000                | 80,004,000                    |

**K. The preceding table gives information about Canada's five most important fishing provinces.**

1. Which province landed the greatest weight of fish?

(a) Which was second, and which was third?

2. Why is the value of the Newfoundland catch much less than that of British Columbia or Nova Scotia, even though it weighs nearly as much as British Columbia's and more than Nova Scotia's? (Compare the kind and the value of fish caught.)

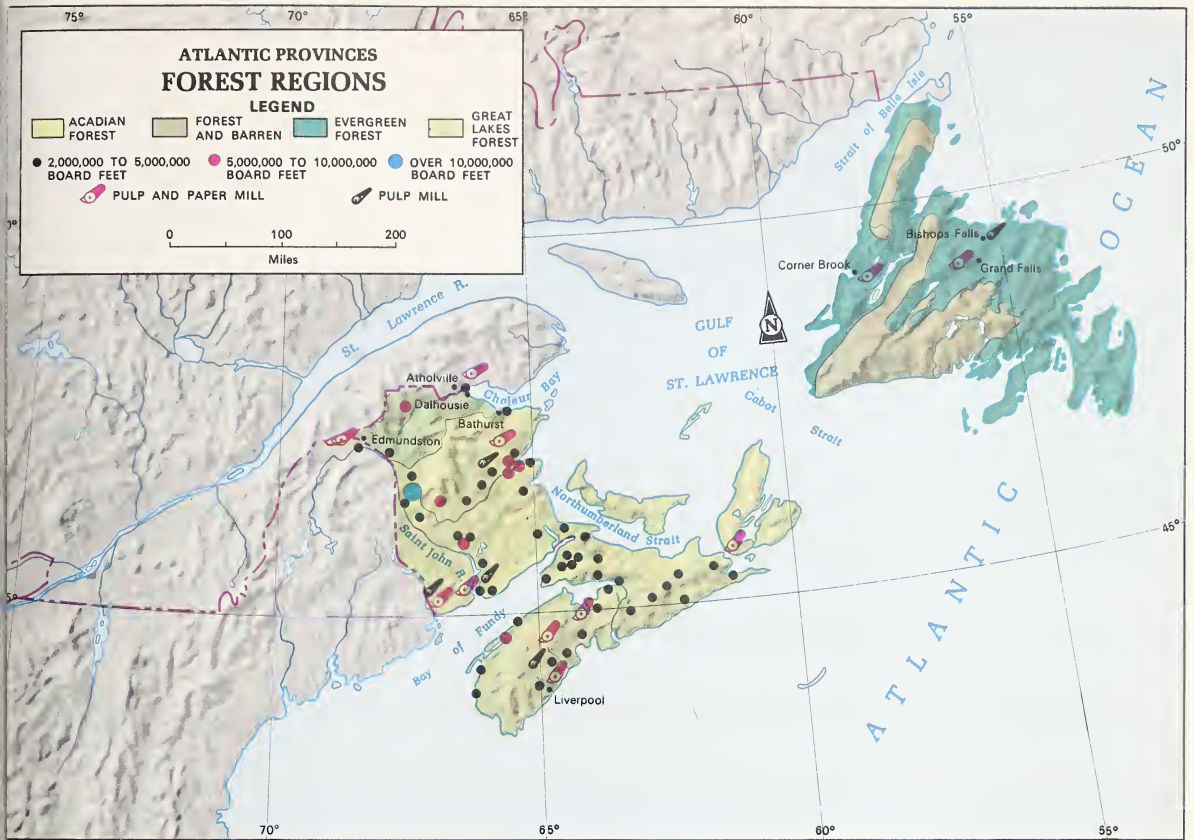
3. Suppose you are on a trawler that sends out a distress signal giving a location of Lat. 45°N., Long. 50°E.

(a) On which fishing bank is your ship in trouble?

(b) How far is your ship from Halifax, and from St. John's?

(c) How long will it take a rescue boat from St. John's travelling at 25 miles an hour, to reach you?





## FOREST RESOURCES

hamper the building of roads and railways?

5. What advantages have mills at the mouths of rivers over those located upstream?

1. The Acadian Forest is similar to the St. Lawrence forests.

2. Name the trees that are common to the Acadian Forest.

3. Where are they found in the Atlantic Provinces?

4. Why doesn't Prince Edward Island have large areas of forest?

5. What type of forest is common to Newfoundland?

6. What climatic factors favour intensive forest growth?

7. Barren land is found in boggy areas of heavy rainfall or in areas having a rocky surface.

8. How does too much rain affect trees?

9. What forces of nature erode thin soil from rocky surfaces?

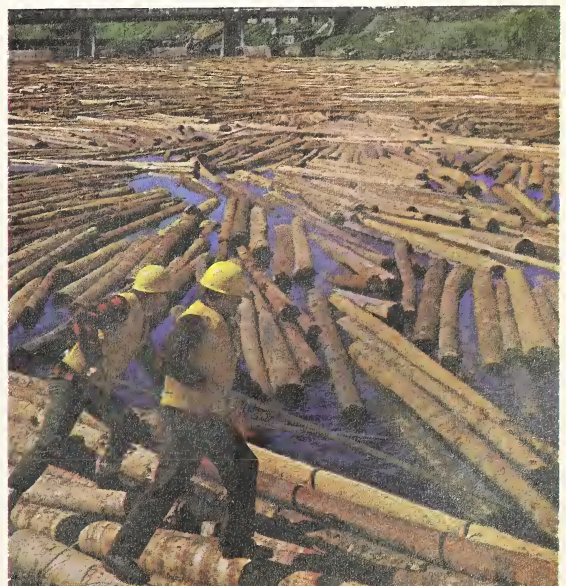
10. Transportation is important to the forest industry.

11. Name the means that are used to transport logs from the forest to the mill.

12. Why are most rivers in this area unsuitable for floating logs to the mill?

13. Why are large inland forest areas of New Brunswick and Newfoundland not used for cutting?

14. What physical features throughout the entire Region



Logs for the Mill





**Corner Brook.** Why is it ideally situated for pulp and paper mills?

**D. Forests are one of the most important resources of the Atlantic Provinces.**

1. Calculate the proportion of the income of the Atlantic Provinces that comes from forest industries.
2. Where is the world's largest newsprint mill located?  
(a) How does climate favour the industry in this area?
3. To what places is the newsprint exported?

**E. The early forest industries supplied wood for shipbuilding and many other types of construction.**

1. How were tall, straight, pine trees used in shipbuilding?
2. How has modern shipbuilding affected the forest industry?
3. Name the means that is used to cut most of the timber in New Brunswick, Nova Scotia, and Newfoundland.

## MINING

**A. Mining is carried on in all the Atlantic Provinces except Prince Edward Island.**

1. Draw a map of the Atlantic Provinces.
2. In your legend list the following: iron ore, iron and steel plants, coal, zinc, lead, and gypsum.
3. Using colour, draw a suitable symbol beside each item listed.
4. Draw the symbol in the appropriate place on the map.

5. What relation do you see between the location of coal and that of the iron and steel plants?

(a) Why would you expect to find this?

6. Name one important use for each of the minerals marked on your map.

**B. Coal has been the most important mineral mined in the Atlantic Provinces.**

1. Where is most of the Atlantic Provinces' coal mined?
2. What is unique about the coal mines at Glace Bay?
3. Suggest another name for a coal mine.

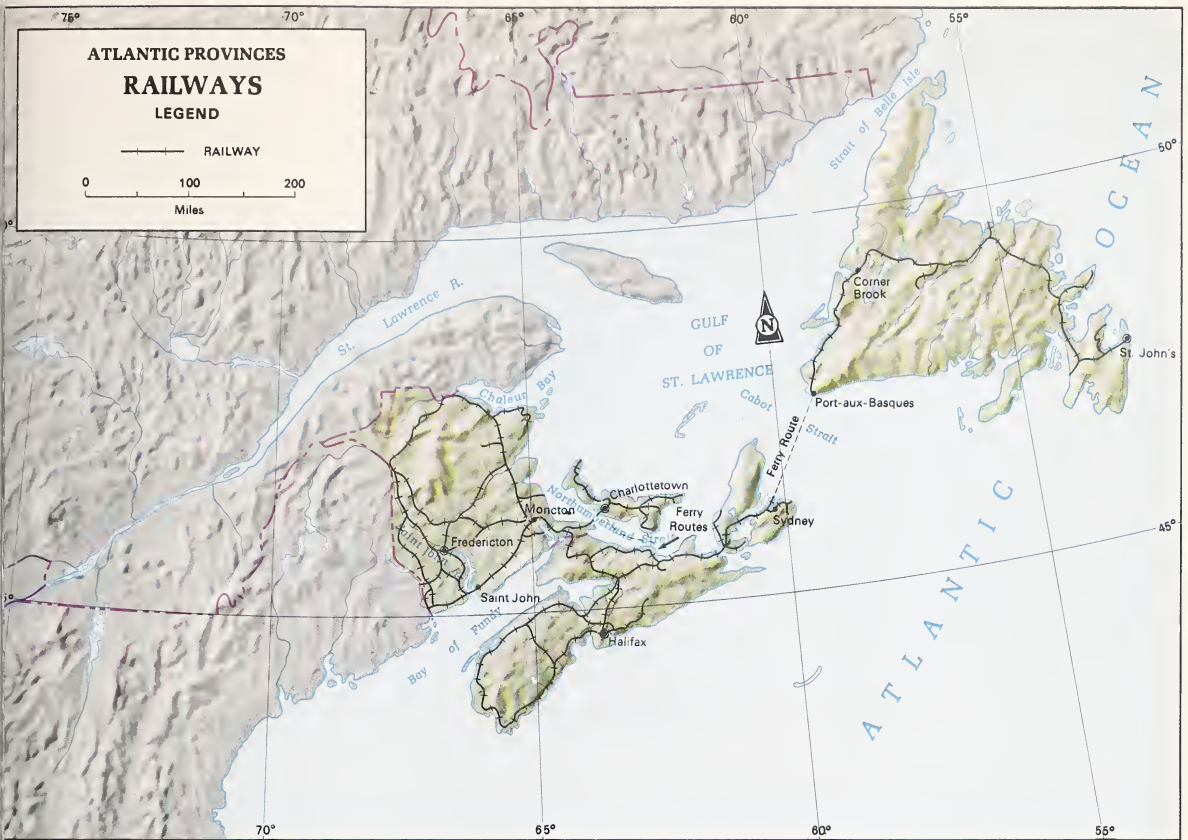


**Miners Entering the Shaft**



**Figure 36 — Profile of an Inclined Shaft**





Map 54

1. Name four dangers that exist in mine tunnels.
2. What name is given to layers of coal?
3. How many tons of coal are mined annually in Nova Scotia?
4. For what two reasons are the miners (shown in the photograph) wearing hard hats?
5. A coal cutting machine can cut and load 500 tons of coal in 8 hours.
6. If a crew of seven men is required to operate this machine, what would be the different duties of: the fore-

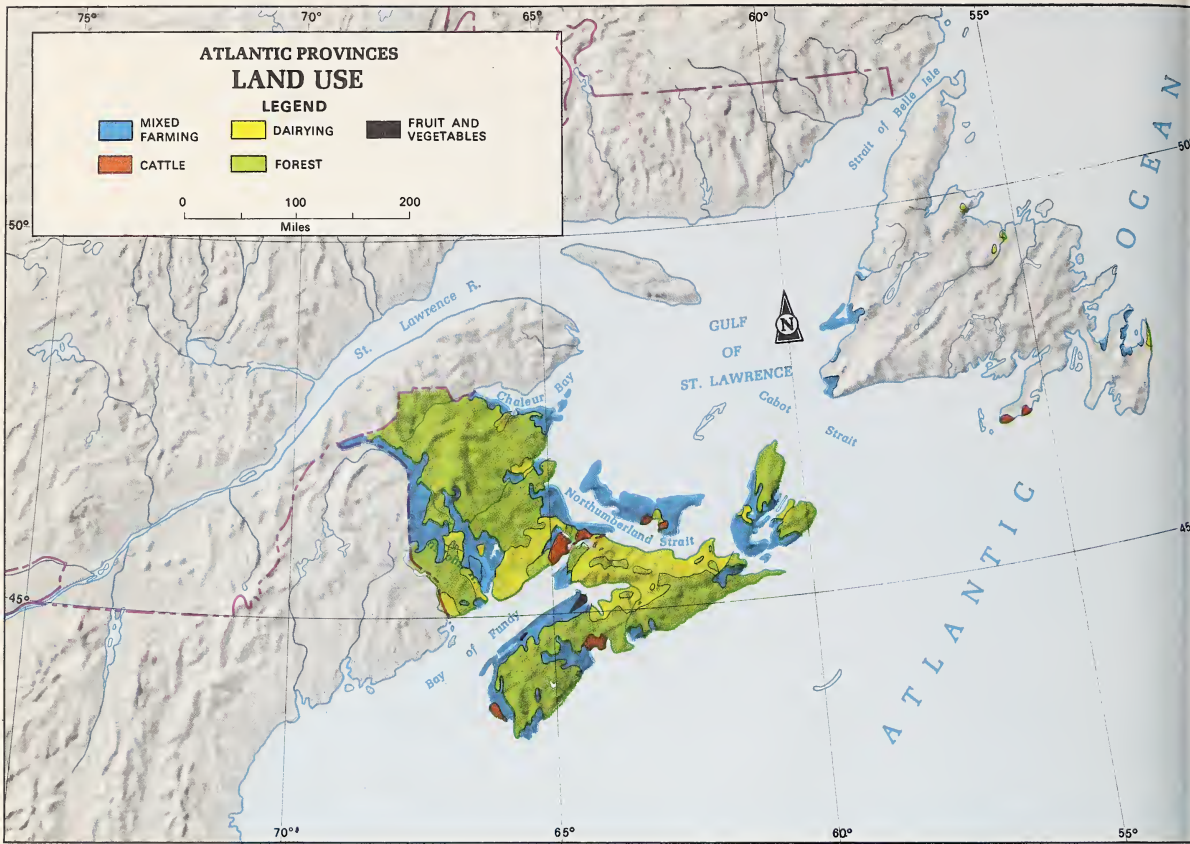
man, the two operators, the three timbermen, and the mechanic?

2. How are the mine cars filled with coal brought to the surface?
3. Why is Sydney a good location for a steel plant?
4. Where does the iron ore used in this plant come from?
5. How does Sydney provide the electricity needed for its steel plants.
6. Suggest reasons for the diminishing importance of coal mining during the past few years.



Steel Plant at Sydney





Map 55

## FARMING

### A. The ruggedness of the topography restricts agriculture.

1. Name the Atlantic province that uses almost all its land for farming.
2. Why is this possible?
3. Which province uses the least amount of its land for farming?
4. Give reasons why large areas of land in three of the provinces have not been cleared for agriculture. (Map 45 provides clues.)
5. If you were a farmer, what other two jobs might you work at to increase your income?

### B. As in the Shield, much of the soil in this Region is not very fertile.

How does the farmer improve the richness of the soil?

### C. The reddish soils of Prince Edward Island are best suited for root crops.

1. What is the Island's chief cash crop?
  2. Why is the farmer shown in the photograph spraying his crop of potatoes?
- (a) How often are they sprayed?

### D. The second most valuable crop is hay.

1. What is hay used for, and why is it important to Prince Edward Island?
2. Why can farmers produce more today although less land is cultivated, and fewer men farm than in the past?
3. Why is Garden of the Gulf a good name for Prince Edward Island?



Spraying



**Annapolis Valley, the Changing Scene**

Compare the location of dairying with the Population Map 51 and the Railway Map 54.

Why is it important for dairy farms to be near large population centres and good transportation routes?

Which river valley in New Brunswick has the most important farming area? Why?

What is the chief product grown there?



**Tantramar Marshes**

**E. The high tides of the Bay of Fundy have left deep layers of excellent soil in the Minas Basin of Nova Scotia.**

1. How high do the tides rise here?
2. Locate the south shore of Northumberland Strait and give two reasons why you would expect this to be an area of good farm land.

**F. The above photograph shows a view of the Annapolis Valley.**

1. Describe the Valley and its surroundings.
2. What two kinds of farming are suggested in the picture?
3. How do the highlands on either side of the valley affect the orchards?

**G. Apple juice and apple sauce have become important export products.**

1. Name the canning centres for these products.
2. Where are most of the farm products of the Atlantic Provinces sold?









Vertical Aerial Photograph of the Halifax Area

## HALIFAX—CANADA'S GREATEST ATLANTIC PORT

As in the Canadian Shield, glaciers have left their mark on Halifax and the surrounding countryside.

From Map 56 describe the surface of the land around Halifax.

a) What symbol is used on the map for railways?

Account for the many bends in the railway lines leading to the coast towns.

Describe the vegetation in the Halifax area.

4. Suggest reasons why the Halifax docks were built where they are, rather than along the North West Arm.

5. Name two ways in which people can cross the harbour from Halifax to Dartmouth.

**B. Glaciers have left little or no soil on the hard rock surface of this area.**

1. How does this affect the digging of sewers and excavations for houses?

2. How has this affected farming in the Region?



C. Map 57 shows that Halifax is nearly surrounded by water.

1. What name is given to such a landform?

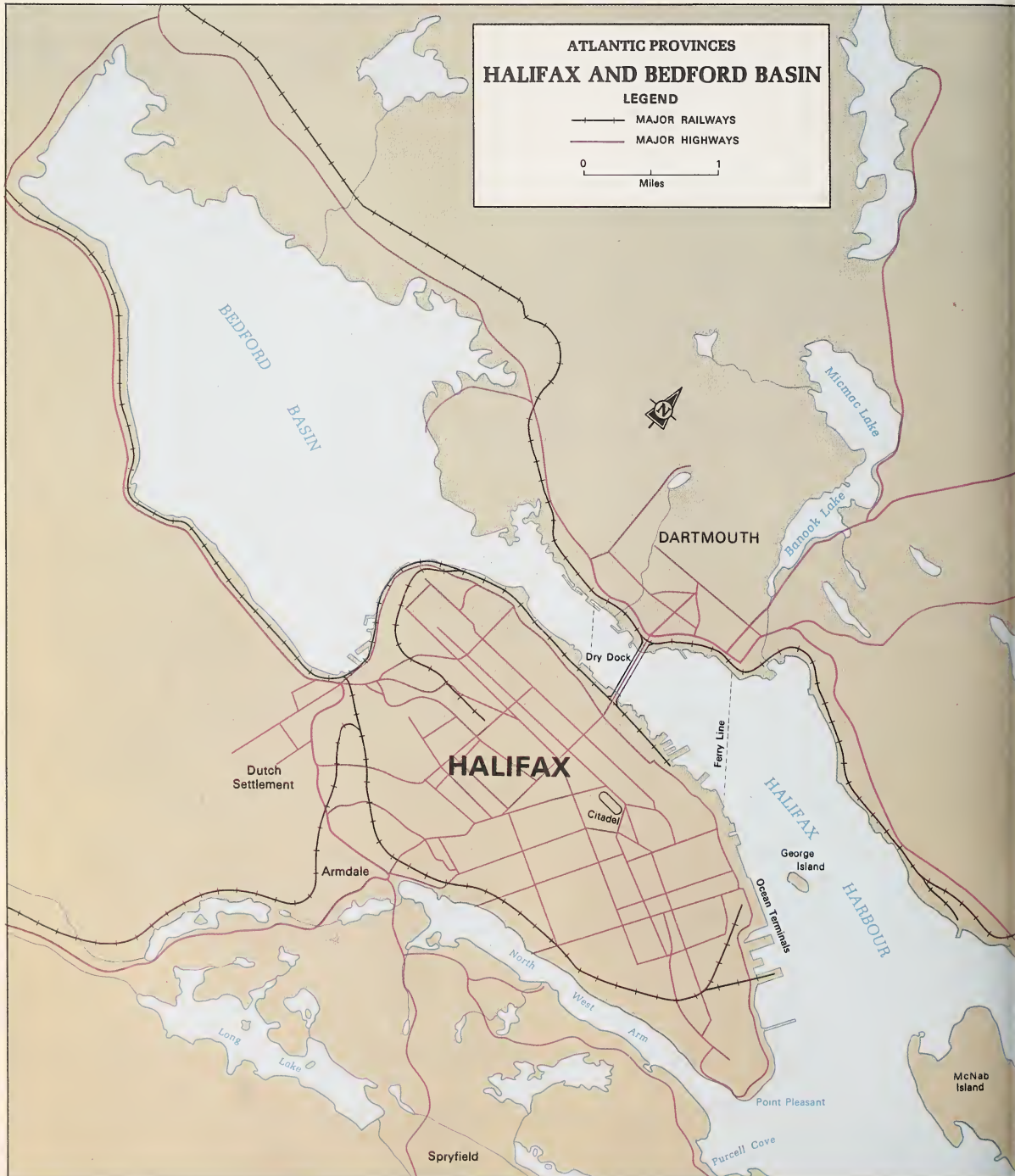
(a) What name is given to the narrow neck of land joining Halifax to the mainland?

2. On Map 56 locate the large body of water north of Halifax.

(a) What is its name?

(b) How does this body of water serve Halifax harbour?

(c) Name the waterway connecting this bay to the main harbour.



Map 57



The Ocean Terminal

**On the west side of Halifax is an inlet called the North West Arm.**

What forms of recreation do people enjoy here?  
How do the photograph and the map suggest that Halifax is an important port?  
Why is Halifax especially important in winter?

**Manufacturing depends upon a supply of local or imported raw materials.**

Divide your page into two columns and title them:  
Manufactured from Canadian Raw Materials, and Manufactured from Imported Raw Materials.

List the following under the proper column: steel,

cocoa, coffee, paper, canned fish and fruit, dairy products, petroleum, wheat, and gypsum.

(b) Beside each item write the name of the city or country of its probable source.

**F. An automobile plant has recently been built in Halifax.** Why was it built here rather than in central or western Canada?

**G. Located on a high hill is a historic fortification called a citadel. It is now a popular museum.**

1. Locate it on the Map 57 and in the above photograph.  
2. Why was this a good location for a fort?  
3. Identify the body of water shown in the above photograph.

(a) What industries are indicated in the foreground?



**H. The smoke coming out of the tall chimneys is from a thermal-electric power plant.**

Why is this a good location for such a plant?

**I. In addition to being the capital of Nova Scotia, Halifax is also an important educational centre.**

1. What university is shown in the photograph?
2. From the photographs and your readings, give five reasons why you, as a tourist, would visit Halifax and the Atlantic Provinces.

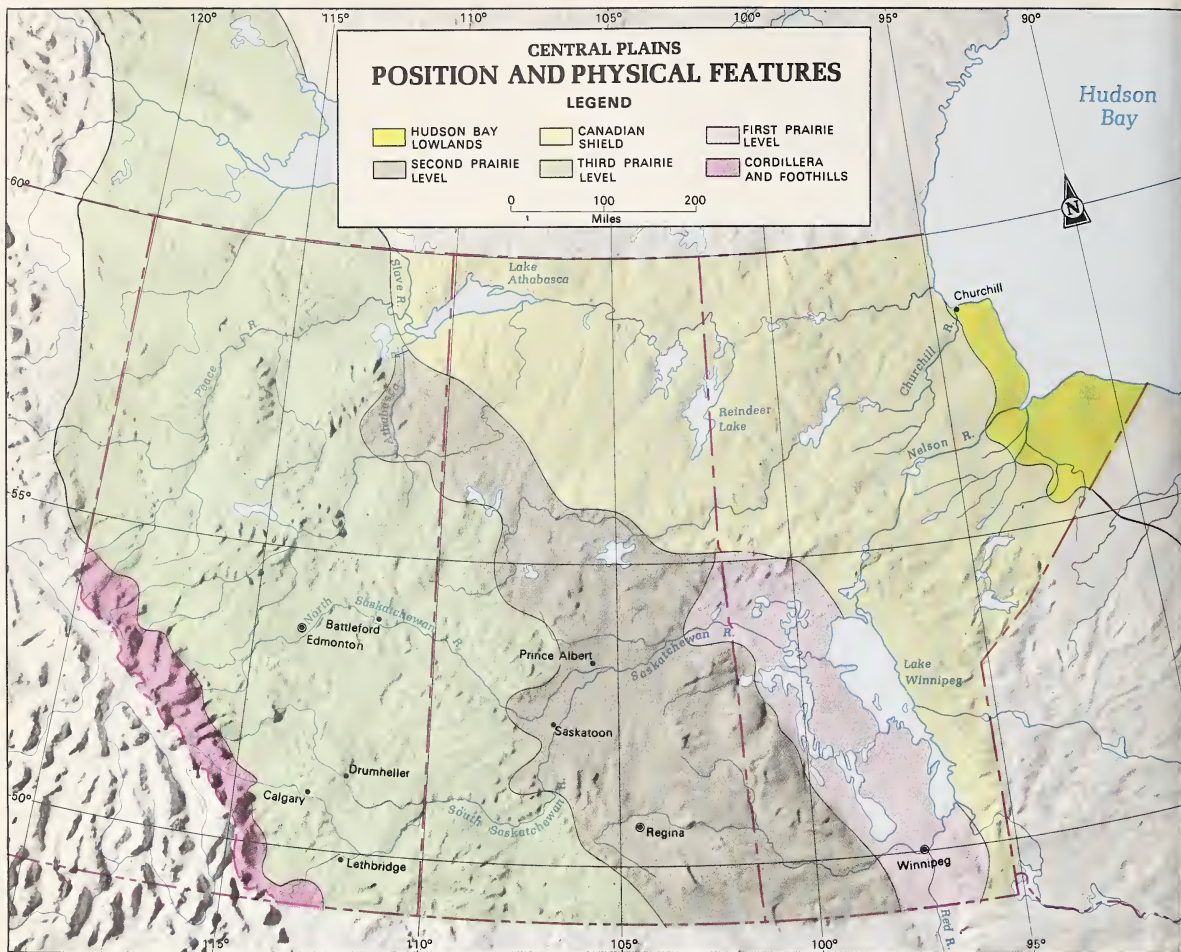


**Centre of Learning**



## THE CENTRAL PLAINS REGION





Map 58

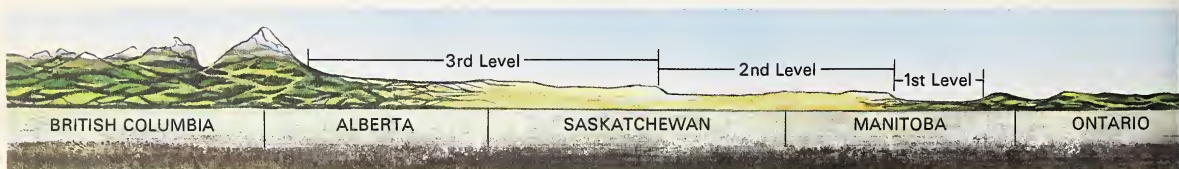


Figure 37 — Profile along the 50th Parallel

## POSITION AND PHYSICAL FEATURES

**A. Prairie Provinces is the name given to three provinces that make up nearly a fifth of the total area of Canada.**

1. Name the three Prairie Provinces.

(a) Which province is the farthest west? the farthest east?

2. What is the latitude of the north, and of the south, boundary of the Prairie Provinces?

(a) How many miles is it between these boundaries?

(b) Calculate the number of miles, along the 50th parallel, between the east boundary of Manitoba, and the west boundary of Alberta.

(c) Compare the distances between the two sets of boundaries in (a) and (b) above.

3. Name the political areas that border the Prairie Provinces.

**B. Prince Albert is the gateway to the northern part of Saskatchewan.**

1. Give several reasons why Prince Albert is an important centre.

2. What is the general slope of the land between Lethbridge and Hudson Bay?



**First prairie level — Manitoba Lowlands**



**Second prairie level — Elevator town of Gray, Saskatchewan**

**The Prairie Provinces contain parts of four physical regions.**

1. Name the four physical Regions.

**The Central Plains are not flat but contain three distinct levels and three different kinds of land surface.**

2. Which plain is the lowest?

3. How high above sea level is this plain?

Study the above photograph of the Manitoba lowlands. What evidence indicates that this area was once part of the bed of a glacial lake?

4. What is the elevation of the second prairie level?

5. Name the physical feature that separates the first and second prairie levels.

6. What is the origin of this landform?

7. Compare the surface of the land on this level with that of the first level.

8. What physical boundary separates the second and third prairie levels?

9. Describe the vegetation and the land surface of the third level.

10. Give the meaning of escarpment, coteau, badlands, and timberline.

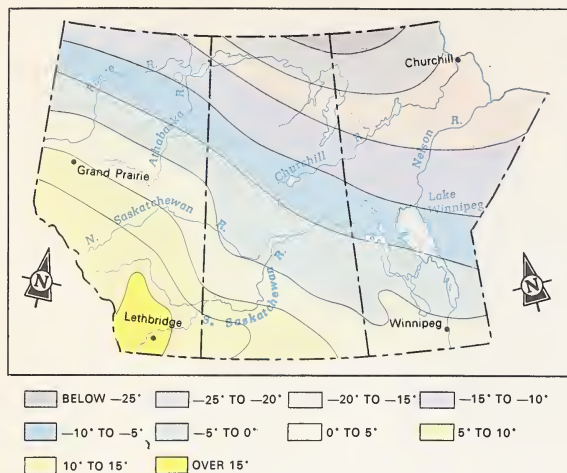


**Stock-watering Dugout in Saskatchewan**



**Irrigation Project near Hays, Alberta. Note area not irrigated.**





Map 61 — Average January Temperatures (°F.)

## CLIMATE

### A. Extremes in climatic conditions are found in the Central Plains.

1. What three factors affect the temperature of an area?
2. Locate, on the Average January Temperature map, where the warmest and the coldest temperatures are found.

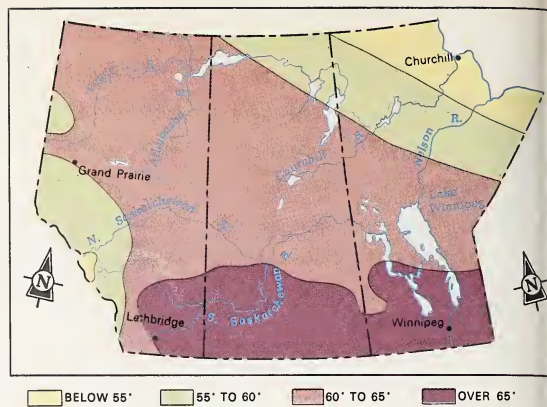
- (a) Account for the location of each.
- (b) Why does Grande Prairie, though farther north, have a January temperature similar to that of Winnipeg?
- (c) What is the average January temperature at: Churchill, Grande Prairie, Lethbridge, and Winnipeg?
- (d) What effect will these temperatures have on the clothing, homes, and occupations of the people who live there?

3. Locate on the Average July Temperature map where the warmest and the coldest temperatures are found.

- (a) Account for the location of each.
- (b) Explain the cool temperature found near the sources of the North and South Saskatchewan rivers.
- (c) What is the average July temperature at: Churchill, Grande Prairie, Lethbridge, and Winnipeg?
- (d) Calculate the temperature range for each of the above centres and compare them with those at Halifax and Toronto.

4. Refer to the Annual Precipitation map.

- (a) Regarding precipitation, account for:
  - (i) its abundance along the southern part of the British Columbia-Alberta border.



Map 62 — Average July Temperatures (°F.)

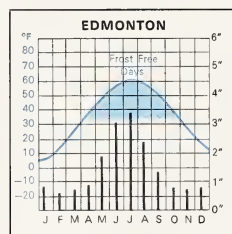


Figure 38

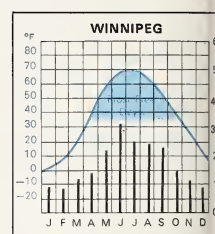
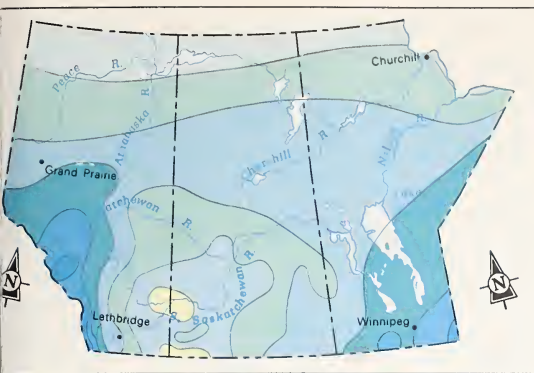


Figure 39

- (i) its increase as one goes south from Winnipeg.
  - (ii) its scarcity in the south-central area of the Prairie.
- (b) At what time during the growing cycle is precipitation most beneficial to crops?
  - (c) From the climatic graphs of Edmonton, Winnipeg, and Medicine Hat, what season has the most precipitation?
  - (d) In areas of light precipitation, what additional means of crop watering must be used?
  - (e) When the westerly winds reach the coast of British Columbia, they are filled with moisture.
    - (i) Why do the east slopes of the mountains receive less precipitation than the west slopes?
    - (ii) Explain what is meant by rain shadow.
    - (iii) Where does it occur in the Central Plains?
    - (iv) Describe the temperature of the westerly winds.
    - (v) What is the effect of chinooks on winter in southern Alberta?
5. Refer to the Length of Frost-Free Period map.
    - (a) Why are large areas of the Prairies not suitable for agriculture?



Map 63 — Annual Precipitation (Inches)

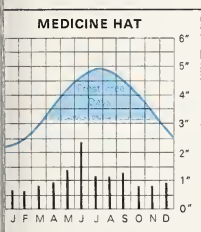


Figure 40

(b) Account for the short frost-free period:

(i) along the southern part of the British Columbia-Alberta border.

(ii) west of Lake Winnipegosis.

(c) What effect does Arctic air have on the frost-free period?

What relation is there between the number of frost-free days and (i) elevation, (ii) latitude, (iii) winds?

Make a climatic graph for Regina from the following information:

Month: J F M A M J J A S O N D

Precip.: 0.6 0.6 0.8 0.8 1.6 3.2 2.1 1.7 1.2 0.9 0.9 0.9 (inches)

Temp.: 1 5 19 38 52 60 66 63 53 41 21 7 (degrees Fahrenheit)

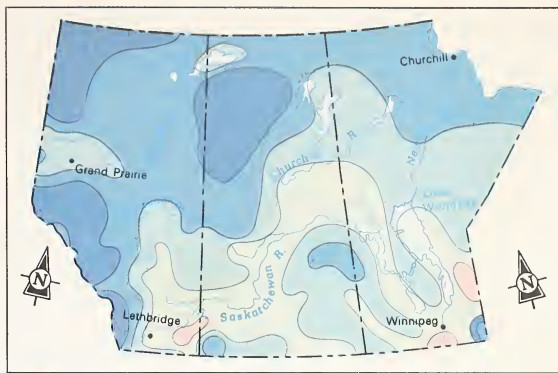
During what season does most precipitation occur?

What effect does precipitation have on the growing cycle during this period?

What type of climate occurs in this Region?

**Winds from three main air masses affecting the climate of the Central Plains are shown on the accompanying illustration.**

Why is a blue arrow suitable for representing air from Arctic?



Map 64 — Length of Frost-Free Period

(a) What barriers channel Arctic air eastward across the Prairies?

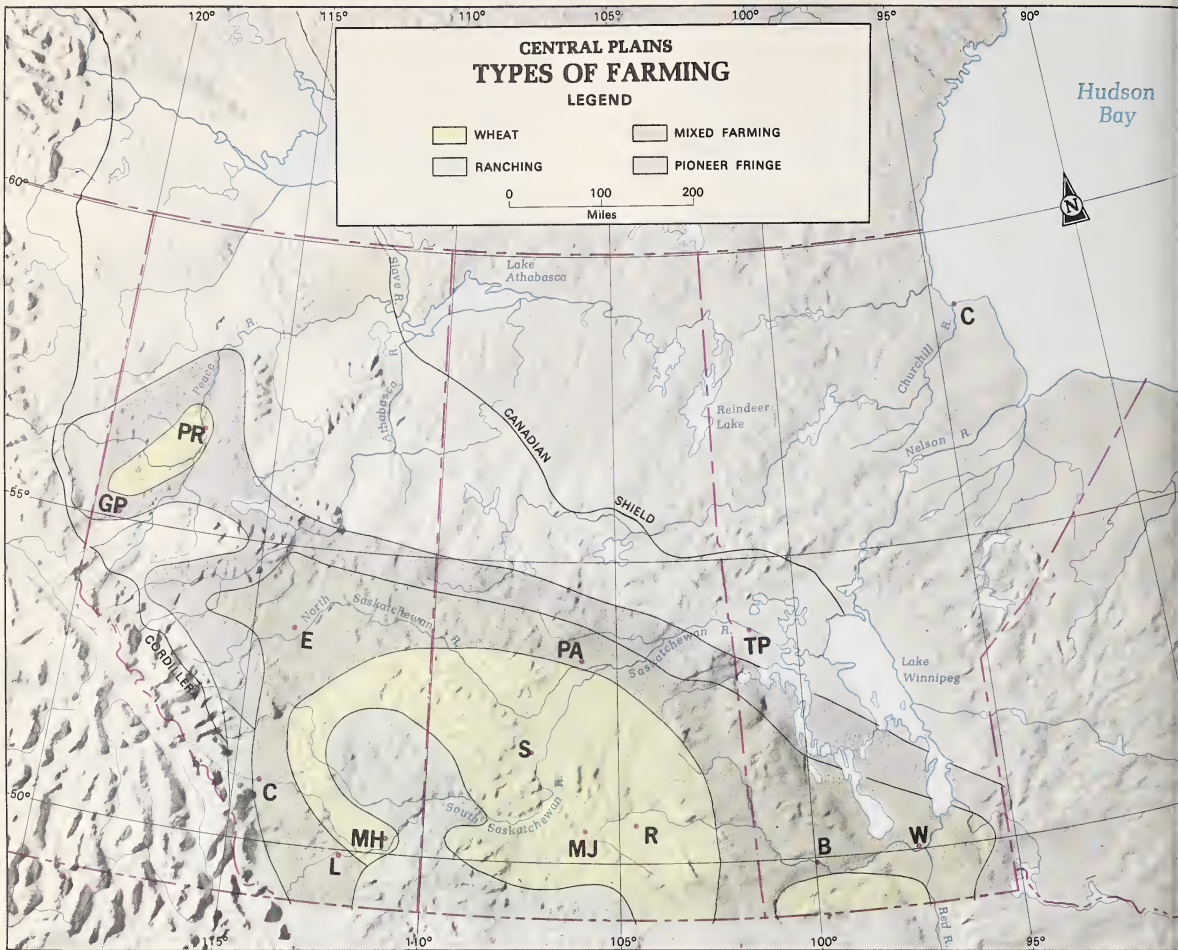
(b) Why is the air from the south both moist and warm?

(c) To what part of the Prairies does it bring moisture?



Figure 41 — Prevailing Winds





Map 65

## FARMING AREAS

**A. The Central Plains Region includes large farms and ranches.**

1. Locate the three areas of wheat farming on Map 65 and compare them with the maps of Precipitation and Frost-Free Period.

- Which area is least likely to require irrigation?
- Which area is most likely to need it?
- Give reasons for your answers.

**B. The soil and climatic conditions of much of the Peace River area are suitable for agriculture.**

Name the grain that is the main source of income.

**C. The photograph (bottom of page 105) shows a wheat field in one of the three areas.**

1. From clues in the picture and from the information given earlier about its climate, name the Region.

- Give reasons for your answer.



Ranching





Mixed Farming

The two main areas of grazing are located in the northern Alberta-Saskatchewan area and in the southern hills of Alberta.

Locate these areas on Map 65, on a relief map, and a precipitation map.

Give reasons why each area is used for grazing and for farming.

Are the cattle in the picture (page 104) beef or dairy cattle?

What are the visual differences between the two types? In which of the two grazing areas was the photograph taken?

State reasons for your answer.

In the Mixed Farming belt, climates are generally cooler than in the Wheat belts, making grain growing somewhat risky.

How do farmers counteract the danger of loss of income from ruined crops?

Why is dairying important near large cities?



Pioneer Fringe

3. Where are the markets for livestock?

4. Make a pie graph showing:

(a) the percentage distribution of beef cattle by provinces.

5. From the clues given in the Mixed Farming picture, near which city was it taken; Calgary, Edmonton, or Winnipeg?

(a) Give reasons for your answer.

**F. Pioneer Fringe refers to territory on the edge of settled areas, where settlers clear the land for their farms.**

1. Compare past and present methods of clearing the land of the Pioneer Fringe.

2. Why was this area not developed earlier?

3. What type of farming is carried on here?

4. Describe the countryside in the picture.

5. Approximately what fraction of the land in the Prairie Provinces is used for farming?

6. Give reasons why the remainder is not farmed.

7. What relation can you see between the cities and farming areas of the Prairie Provinces?



Wheat





**Prairie Town** — Identify and explain the function of the three buildings in the foreground.

## WHEAT

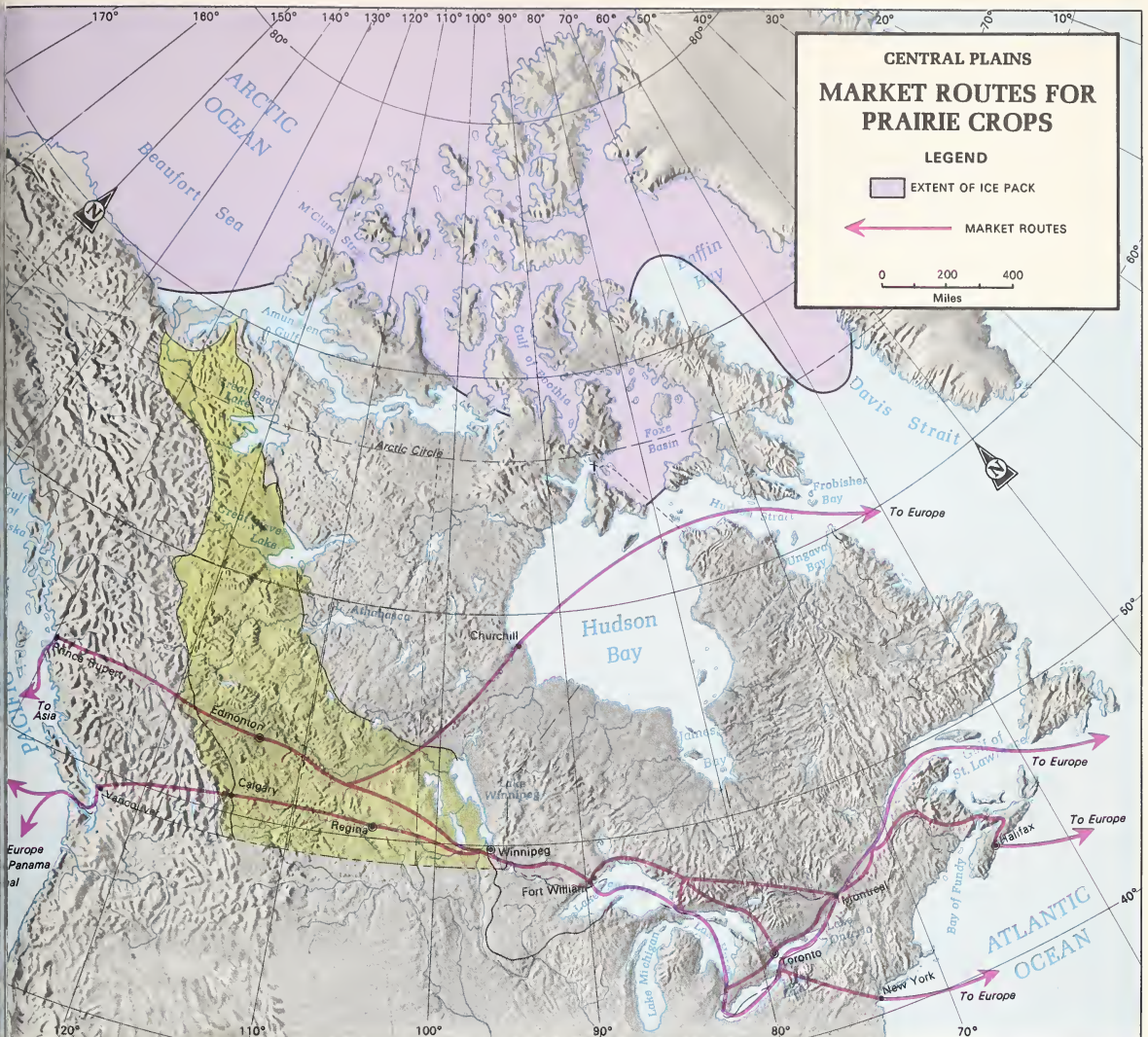


**Figure 42 — Canada's Wheat Production by Provinces**

**A. Wheat is the main agricultural product of the Central Plains.**

1. On an outline map of the Prairies, shade in areas where wheat is grown.
2. Give at least three reasons why it is the main product.
3. Compare your map with Map 63 (precipitation), and Map 64 (frost-free period).
4. What relation is there between wheat farming and precipitation?
5. How much precipitation is required to grow this grain?
6. According to Map 64 (frost-free period), what is the minimum number of frost-free days required to grow grain?
7. Which province produces the most wheat?
8. What percentage of all the wheat produced in Canada is grown in the Central Plains?





Map 66

**Better farming equipment and improved farming methods are most important to the increasing wealth of the Plains.**

Complete each sentence in column A by matching the correct ending in column B.

Tell how each was a benefit to the wheat farmer.

| A  | B  |
|--|--|
| Scientists developed new strains of wheat that | — made it possible to cultivate hard clay soils.                                       |
| The development of the steel plow              | — in newly plowed fields.  |
| Single strand barbed wire fences               | — ripened in less than 110 days.   |
| Farmers left regular rows of stubble unplowed  | — enclosed fields for grazing.   |
| The invention of the gasoline engine           | — made possible equipment such as tractors, threshers, combines, and seeding machines. |

**C. In 1966 Canada grew a record 827 million bushels of wheat.**

1. What percentage of this was exported?
2. What countries are important buyers of Canadian wheat?
3. With the aid of Map 66, explain the important role played by the following in the export of wheat.
  - (a) grain elevators.
  - (b) railway.
  - (c) the cities of Churchill, Vancouver, Fort William, Montreal, and New York.
  - (d) St. Lawrence Seaway.
  - (e) lake freighters.

**D. Throughout the year, the wheat farmer faces many risks, any of which would mean the loss of a whole year's work.**

1. From the following list of risks, copy the ones he can control, and explain how: drought, hail, frost, rust, erosion, fire, insect pests, a single type of crop, surplus, and market.





**Dry Farming.** How can you tell that the farms are large?



**Watering Hole.** Explain the function of the windmill.

## DRY BELT

### A. Dry Farming is carried on in parts of the Prairies.

1. Describe fallow land.
2. Why is land left in this condition?
3. In the Dry Belt, how often is a field left fallow?
4. What is the chief crop of this area?
5. How do the crops compare with those on irrigated land in this area?

### B. Large ranches are found in the Dry Belt.

1. What part of the Prairies is called the Dry Belt?
2. Give evidence that there is little rainfall in the Region.
3. What effect has the lack of rain on farming? (C) vegetation for pasture?
4. How large is the average ranch? Why?
5. How does the rancher supply drinking water for his animals?

### C. Irrigation enables the farmer to be less dependent on the weather as shown in the photo on page 109.

1. By what means does the farmer guide the water where it is needed?
2. What evidence is there that the land is very level and flat?





Map 67



Flood Irrigation of Barley

At what time of year was this picture taken?  
 Why will this type of irrigation not work in hilly country?  
 Suggest a type of irrigation that could be used.

**MAP 67****THE SOUTH SASKATCHEWAN RIVER PROJECT**

What is the average annual amount of precipitation in the Dry Belt? (See map, Precipitation).

- How much precipitation is received during the growing season of May, June, and July?
- How many acres of land will this irrigation project affect?

**D. The main dam, 210 feet high and slightly more than three miles long, is located south of Outlook.**

- What material was used to construct the dams?  
 (a) Why was it used?
- In what direction does the water of the South Saskatchewan River flow in this area?
- Name both the main dam and the large man-made lake.

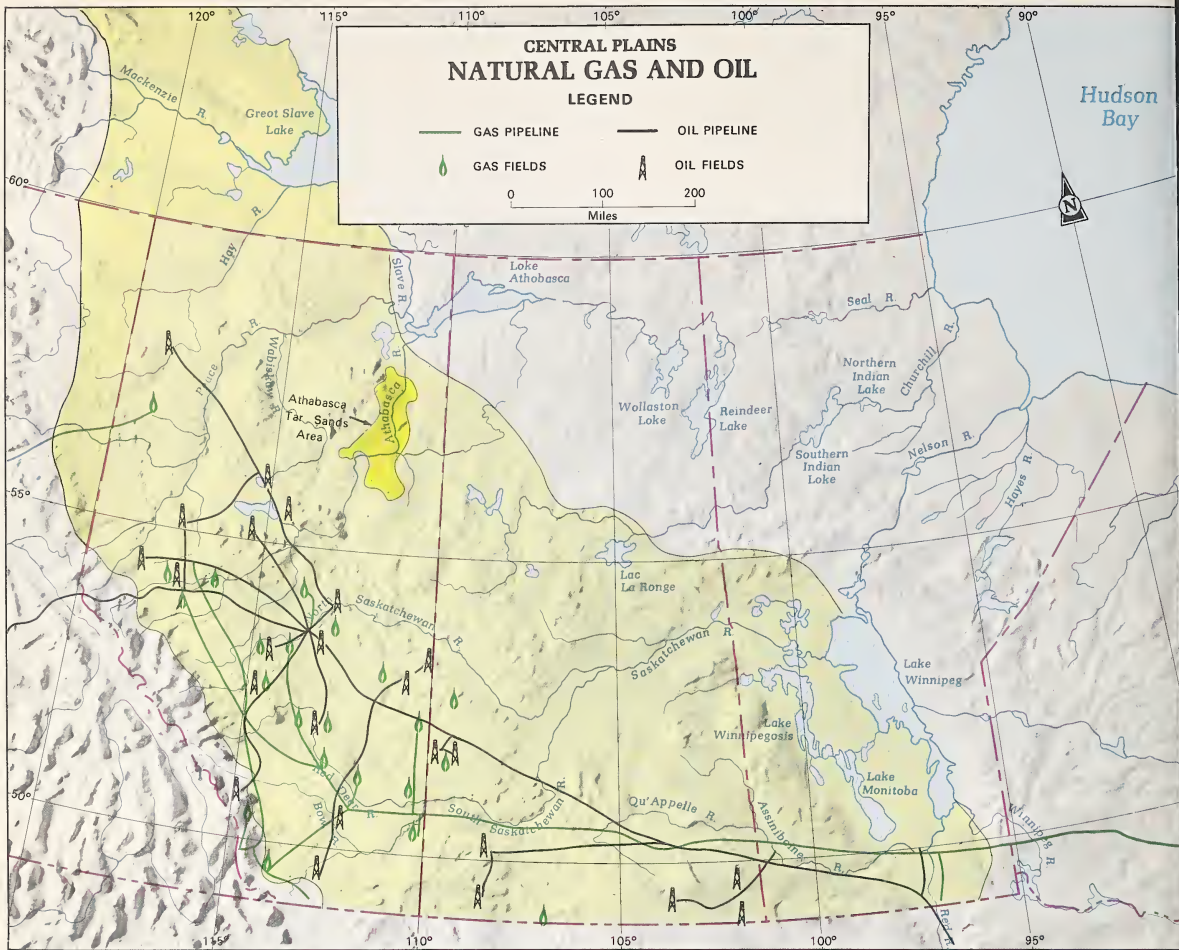
**E. Much of the water from the lake could be lost down the Qu'Appelle Valley.**

- Why could this happen?  
 (a) How is this prevented?

**F. The water stored by this project will benefit Saskatchewan in at least four ways.**

- Explain the four ways by using the following clues:  
 (a) a high dam  
 (b) a dry farming area  
 (c) reservoir  
 (d) recreation





Map 68



Drilling Rig in Wheat Field





Figure 43 – Oil and Natural Gas Deposit

## MINING

### OIL AND NATURAL GAS

The above drawing shows that natural gas and oil are often found together.

Why is this so?

Compare the location of the main oil and gas fields with a map of physical regions on page 98.

If you were drilling for oil or gas, in what physical region would you have the best chance of success?

Which province has the richest oil fields?

Name the city that serves as the centre of the oil industry and explain how it has been affected by this industry. *Calgary*

Explain the following as they apply to the oil industry: derrick, pump, crude oil, and refinery.

**Cost and risk are two major factors to be considered when drilling for gas and oil.**

As an engineer, what consideration would you give to cost and risk before you started drilling a new well?

Why are pipelines (see Map 68), rather than other means of transportation, used to carry oil over great distances?

How far is it (via pipeline) from Edmonton to Vancouver? to Port Credit?

**It costs 50 cents a barrel to pipe oil to Port Credit and only 10 cents less a barrel to Vancouver from Edmonton.**

Why does it cost so much to pipe it to Vancouver?

Locate three large oil fields in the Central Plains.

List five uses of oil.

Make a pie graph showing Canadian oil production using the following information: Alberta, 72 percent; Saskatchewan, 25; and Rest of Canada, 3 percent.

**The Athabasca Tar Sands may hold the largest known oil reserves in the world.**

Locate the Tar Sands on Map 68.

a) What are the Tar Sands?

b) Why have the Tar Sands not been developed on a large scale until recently?

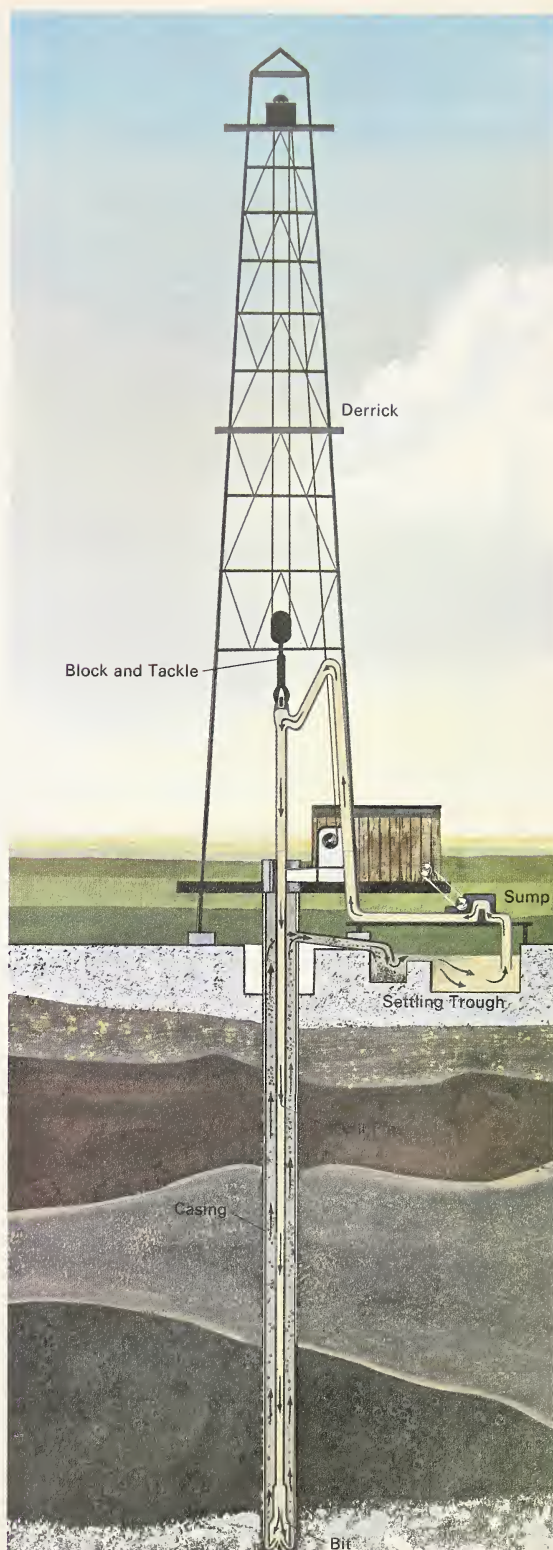


Figure 44 – Profile of a Drilling Rig





Natural Gas Wellhead at Waterton, Alberta

**E. The Trans-Canada Pipeline is the longest gas pipeline in the world.**

1. Name the two main gas fields.
2. What are three uses of natural gas?
3. Locate and name the two main oil and two main gas pipelines in Canada.
4. What effect has the availability of abundant oil and gas had upon many thousands of people in the Plains and on industries in your area?

**COAL**

**F. There has been a general decline in coal production in this Region.**

1. Suggest reasons for this decline.
2. Why is Alberta coal more expensive than that mined in Saskatchewan?
3. Compare the qualities of lignite, anthracite, and bituminous coal.

**POTASH**

**G. One of the world's greatest potash deposits was discovered in Saskatchewan in the process of drilling for oil.**

1. What is potash used for?
2. Draw a map of Saskatchewan and label the following centres on it: Unity, Esterhazy, Saskatoon. Shade in the area where potash is found.
3. How far below the surface is this layer of minerals located?
4. What difficulties are encountered when drilling for this mineral?
5. How is potash brought to the surface?

**SALT**

**H. Salt is found in the form of natural brine and in beds of rock salt.**

1. Compare the method of mining natural brine with that of mining rock salt.
2. In your atlas, locate the following places:
  - (a) In Alberta—Waterways, McMurray, and Lindbergh.
  - (b) In Saskatchewan—Unity and Simpson.
  - (c) In Manitoba—Neepawa.
3. For each of the above places, state if rock salt or brine is found there.

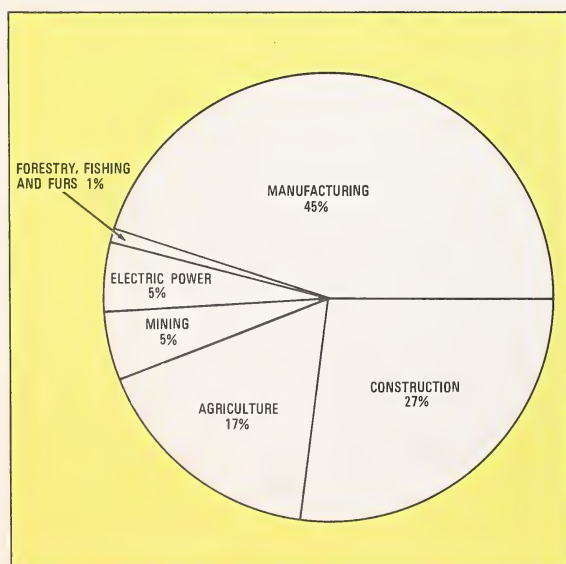
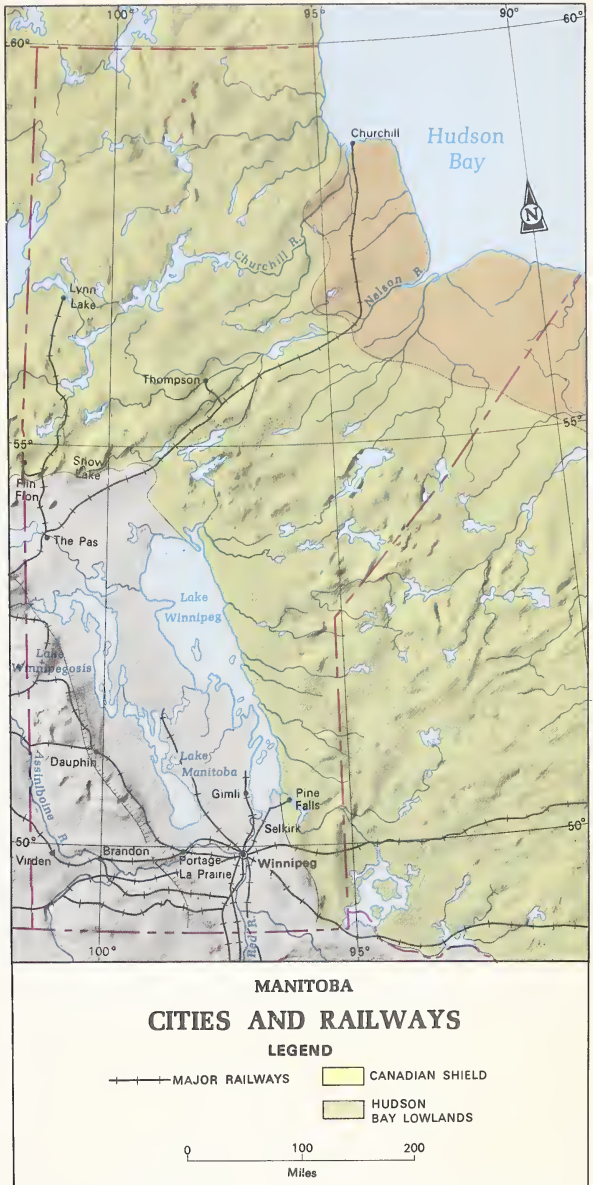


Figure 45 — Sources of Manitoba's Wealth



Map 69

Map 70

## MANITOBA

A. Manitoba contains three physical Regions.

### MAPS 69 AND 70

1. Name the three physical Regions.

2. Which of the three Regions occupies the greatest area?

B. The concentration of population is in the southern part of the province.

1. Why has settlement centred in this area?

C. Wheat and other grain crops are supported by the rich soils of the Plains Region.

1. In what part of Manitoba is the wheat belt located?





Loading Grain at Churchill

2. What facilities has Churchill for storing large quantities of wheat?
- (a) Why does it have these facilities?
- (b) How does climate affect the export season at Churchill?

3. How did water help in the exploration and development of this province?

4. Which Region has the largest number of railway lines? Why?

**D. Winnipeg is often called the Gateway to the West.**

Why is this a good name?



Map

**E. Because of its location, Winnipeg has become the largest manufacturing city on the Canadian Prairies.**

1. What are the indications that Winnipeg is an important distributing centre?
2. Name four of its products.





Winnipeg and St. Boniface

# MAP 71

5. By what means is electricity produced in the Shield Region?

6. Name the centres and industries that use this power.

7. **Winnipeg produces electricity in thermal generating plants.**

1. What mineral is used for fuel?

2. Why is water power not used?

8. **The greater part of Manitoba lies within the Canadian Shield.**

Locate the following mining centres on a map: Flin Flon, Lynn Lake, and Thompson.

- (a) List the minerals mined in each centre named above.
- (b) How do the products from those minerals serve us in our homes?

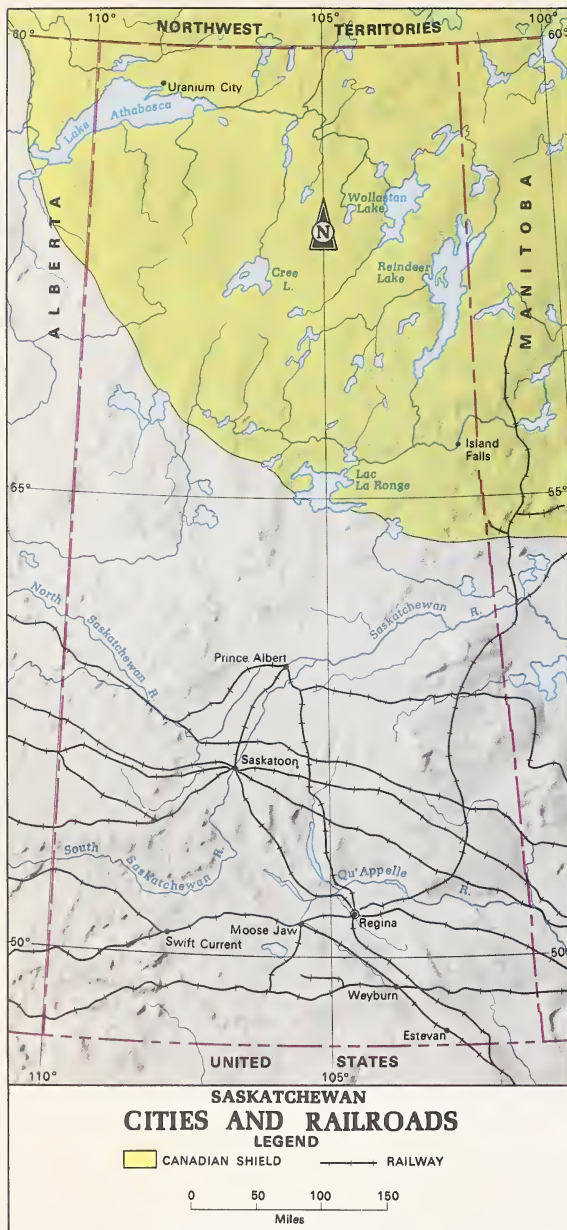
**H. Manitoba's population contains varied ethnic origins.**

1. Name the main ethnic groups.

2. Where have they settled?

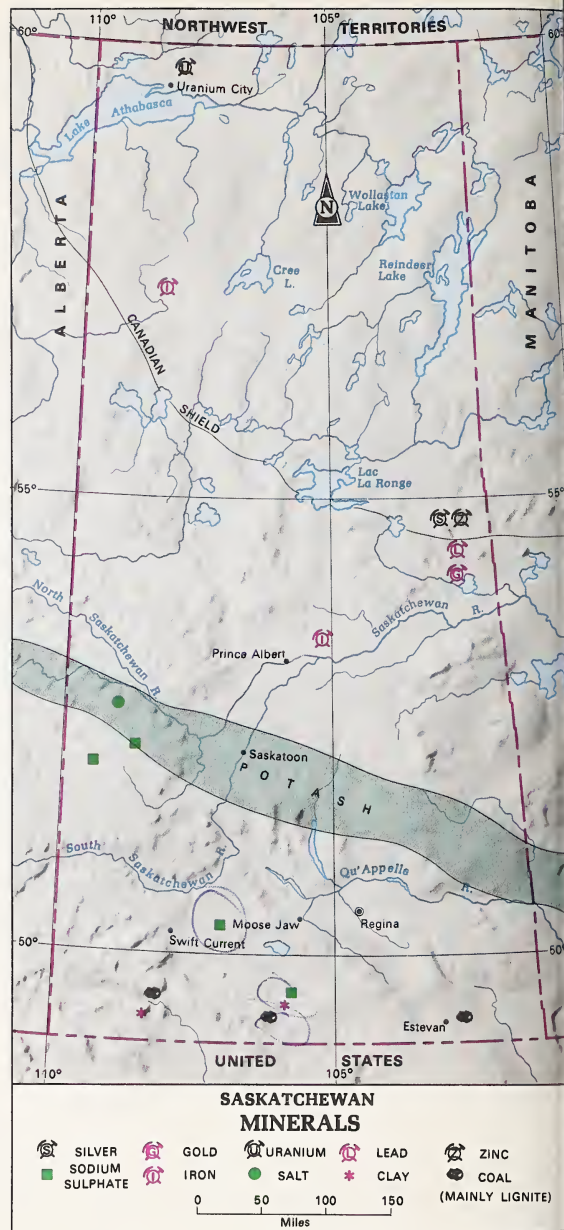
3. Why has the population increase in Manitoba not kept pace with that of either Saskatchewan or Alberta?





Map 72

## SASKATCHEWAN



Map 73

**A. Figure 46 shows the sources of Saskatchewan's wealth.**

1. In order of importance, list the four main activities and the percentage of wealth involved.
2. For each of the four activities that you have listed tell how the railway plays an important role.

**B. The accompanying chart shows mileages, by railway, between cities.**

1. How far is it by train from Regina to Winnipeg? Regina to Montreal? Saskatoon to Toronto?

2. Why does it cost less to export prairie wheat to Europe via Churchill than via Montreal?

3. Why is this route not used year round?

**C. Wheat is the most important crop grown in Saskatchewan (see graph page 106).**

1. Of all the wheat grown in Canada what percentage is harvested in the Canadian Prairies?
2. What percentage does Saskatchewan produce?
3. List other crops that are harvested on a typical farm in southern Saskatchewan.

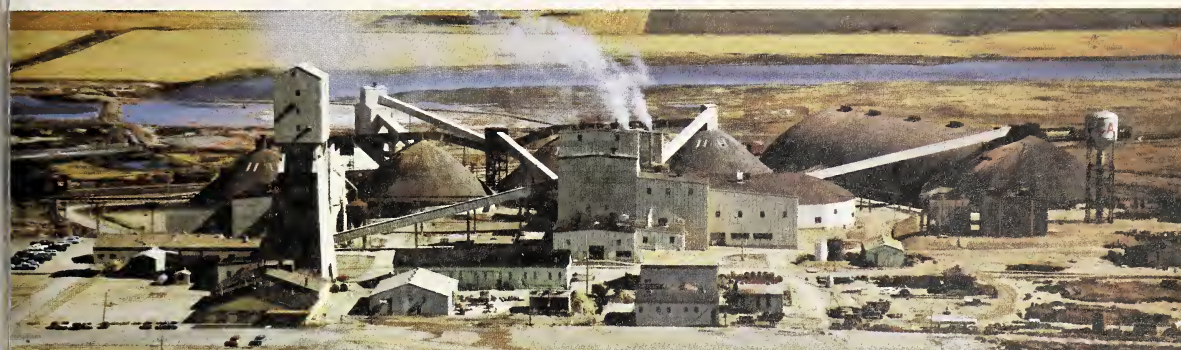
- Approximately what fraction of cultivated land is left fallow during the summer?
- How does leaving the land fallow help overcome drought?
- Tell how the farmer attempts to avoid weeds and erosion on fallow land.
- Locate the Cypress Hills area on a map.
- Why does this area provide a change of scenery for a prairie farmer?
- What indications are there that more rainfall is received in this area than in the surrounding prairies?
- Describe the land surface in the distance.
- What is the chief industry in this area?
- Name the industry suggested in the foreground of the picture.
- The recent development of oil and natural gas resources has added a new dimension to the economy of southern Saskatchewan.**



Cypress Hills

- Locate and list the main oil and natural gas fields.
- Why are they found in the Plains Region and not in the Canadian Shield?
- List other minerals found in the Plains Region.
- Describe the impact of oil and natural gas developments upon the people of Saskatchewan.
- Very little development has occurred in the Shield part of Saskatchewan.**

1. Locate Uranium City and explain how it is affected by the uranium market.
2. List other resources in the Shield that provide wealth for Saskatchewan.



Potash Mine at Patience Lake, Saskatchewan

|    | BANFF | CALGARY | CHURCHILL | EDMONTON | HALIFAX | MONTREAL | PORT ARTHUR | REGINA | SASKATOON | TORONTO | VANCOUVER | WINNIPEG |
|----|-------|---------|-----------|----------|---------|----------|-------------|--------|-----------|---------|-----------|----------|
| 2  |       |         |           |          |         |          |             |        |           |         |           |          |
| 97 | 1,215 |         |           |          |         |          |             |        |           |         |           |          |
| 76 | 194   | 1,139   |           |          |         |          |             |        |           |         |           |          |
| 63 | 2,971 | 3,131   | 2,939     |          |         |          |             |        |           |         |           |          |
| 73 | 2,191 | 2,351   | 2,159     | 780      |         |          |             |        |           |         |           |          |
| 37 | 1,255 | 1,415   | 1,223     | 1,761    | 981     |          |             |        |           |         |           |          |
| 58 | 476   | 844     | 492       | 2,495    | 1,715   | 779      |             |        |           |         |           |          |
| 82 | 400   | 815     | 330       | 2,609    | 1,829   | 891      | 162         |        |           |         |           |          |
| 21 | 2,039 | 2,199   | 2,007     | 1,115    | 335     | 808      | 1,563       | 1,677  |           |         |           |          |
| 39 | 641   | 1,916   | 765       | 3,657    | 2,832   | 1,896    | 1,117       | 1,087  | 2,680     |         |           |          |
| 14 | 832   | 992     | 800       | 2,139    | 1,359   | 423      | 356         | 468    | 1,207     | 1,473   |           |          |

Figure 47 — Mileage, by Rail, Between Important Centres

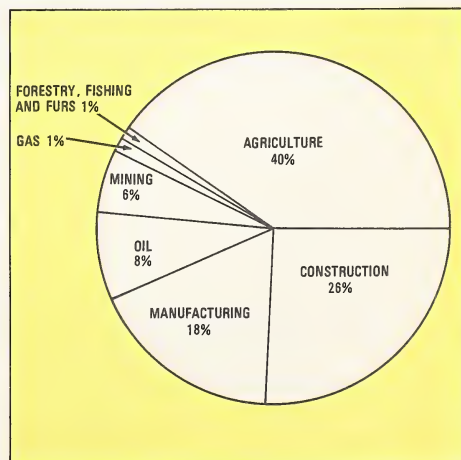


Figure 46 — Sources of Saskatchewan's Wealth

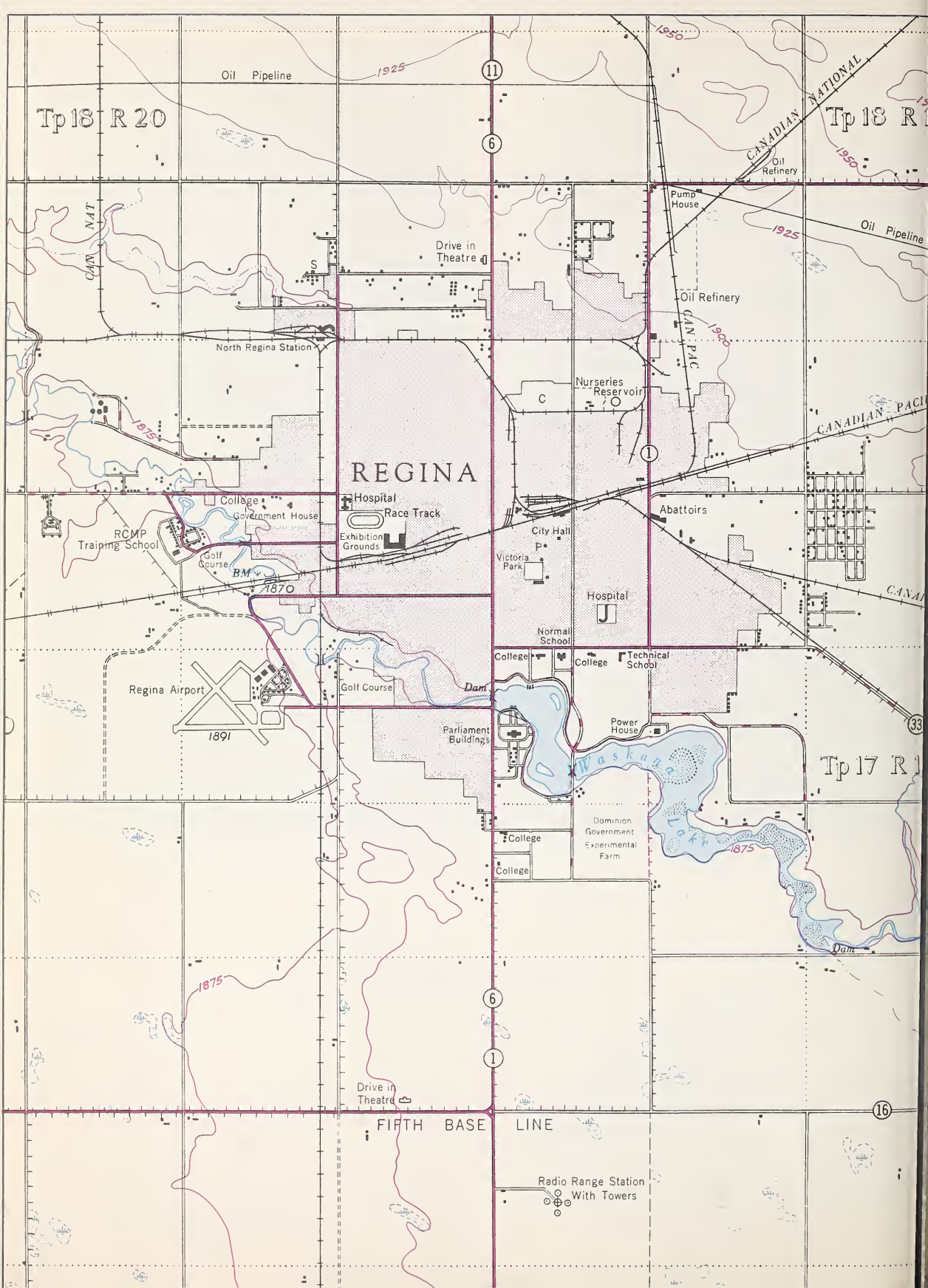


Tp 18 R 20

Tp 18 R 1

Tp 17 R 1

# REGINA







Vertical Aerial Photograph of Regina.

#### MAP 74

1. The selection of the site of Regina was the result of the building of the C.P.R. through rich agricultural farmland.

2. Why might we refer to Regina as a "railway hub"?

3. Locate the industrial areas shown in the map.

4. How can you tell from the map that Waskana Creek is flowing towards the northwest?

4. Describe the site of Regina.

(a) Study the sites of other prairie cities.

(b) Compare their sites with that of Regina.

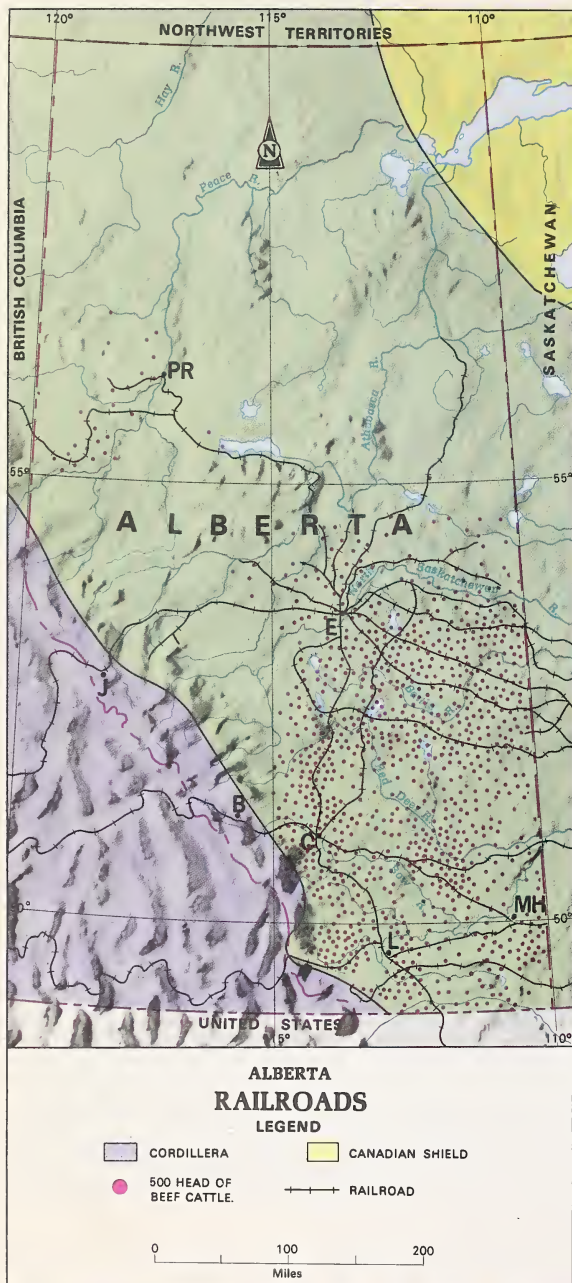
(c) What do most of these sites have in common?

#### FROM AERIAL PHOTO

5. Locate the following: (a) oil refineries, (b) Waskana Lake, (c) the race track, and (d) the Parliament Buildings.



# ALBERTA



Map 75



Oil Rig



Roughnecks



Pump



Pipeline

**A. There are only three rail routes shown between southern Alberta and British Columbia.**

1. Why are there so few?
2. Suggest two important farm products carried by the railway.
3. Identify the cities shown and marked by letters on the map.
4. Which appears to be the most important city in Alberta? Why?
5. Tell the importance of each city designated on the map.

**B. In the photograph on page 121 cattle are grazing in southwestern Alberta.**

1. Are they dairy or beef cattle?
2. What three features of the landscape tell you that it is in the Dry Belt?

**C. The graphs indicate that most cattle in the Prairie Provinces are raised for beef, rather than for dairy products.**

1. Why would you expect this to be so?
2. What fraction of beef cattle raised in Canada is from Alberta?
3. Name the markets for Alberta beef.
4. In which areas of Alberta would you expect to find dairy cattle?

**D. The graph on page 121 shows the importance of livestock and crops in Alberta.**

1. Which of the two is more valuable as a source of cash income?
2. What fraction of the total farm income comes from livestock? What fraction comes from wheat?
3. If you were a rancher, in what part of Alberta would you settle? Why?
4. Using the following headings, tell about the problem in ranching and how you would solve them:





**Ranching in the Dry Belt**

- feeding and watering the cattle in the summer and winter.
- rounding-up cattle for market.
- identifying your own cattle.

**Alberta is the leading producer in Canada, of oil, natural gas, coal, and their chemical byproducts.**

On your own words and with the help of the five pictures, write a short note titled **Oil—Exploration to Storage Tanks**. Begin your story by telling how scientists explore likely deposits of oil.



**Refinery**

|           |  |
|-----------|--|
| LIVESTOCK | CATTLE, HOGS, SHEEP, DAIRY PRODUCTS<br>POULTRY 43% |
| CROPS     | WHEAT 28%  |
|           | OATS, BARLEY, RYE, FLAXSEED 19%                    |
|           | OTHER CROPS 10%                                    |

**Figure 48—Farm Cash Income of Alberta**

|                                   |                                   |
|-----------------------------------|-----------------------------------|
| QUEBEC 36%                        | ALBERTA 29%                       |
| ONTARIO 32%                       | ONTARIO 24%                       |
| ALBERTA 9%                        | SASKATCHEWAN 21%                  |
| SASKATCHEWAN 6%                   | MANITOBA 10%                      |
| MANITOBA 7%                       | QUEBEC 9%                         |
| BRITISH COLUMBIA<br>NEW BRUNSWICK | BRITISH COLUMBIA<br>NEW BRUNSWICK |
| P.E.I.<br>NOVA SCOTIA } 10%       | P.E.I.<br>NOVA SCOTIA } 7%        |

**Figure 49—Percentage Distribution of Dairy Cattle**

**Figure 50—Percentage Distribution of Beef Cattle**



**F. Edmonton is Canada's most northern major city.**

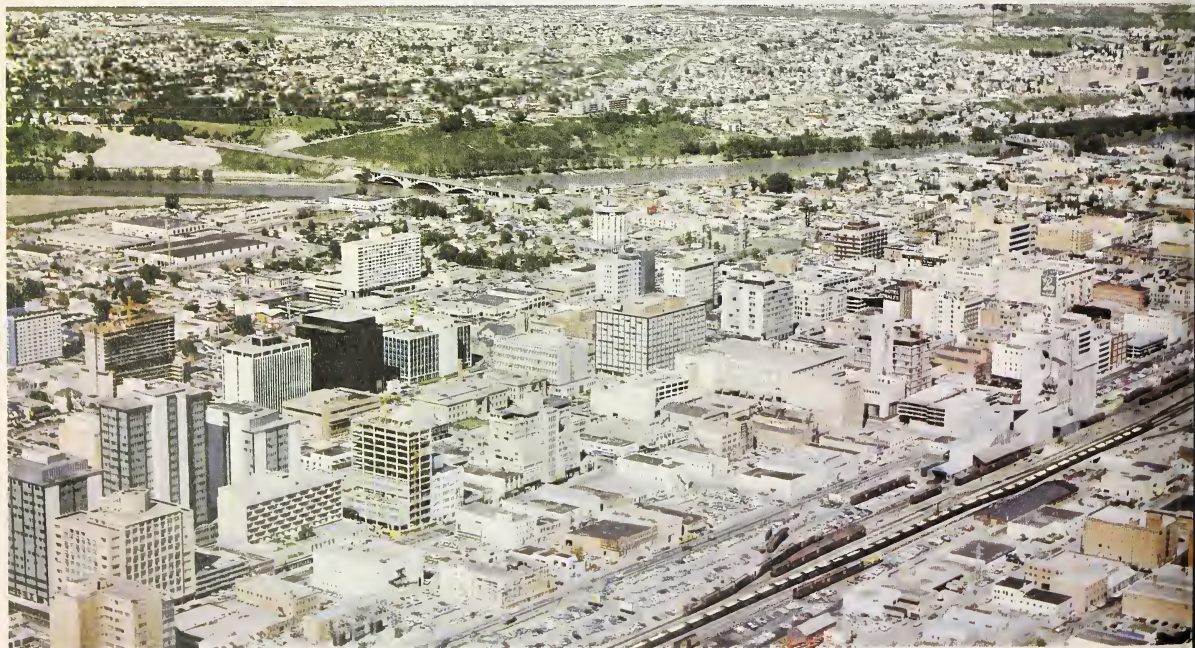
1. Compare its latitude with that of Vancouver, Winnipeg, Windsor, and Halifax.
2. Why has Edmonton become an important city? (See page 35 — St. Lawrence Lowlands.)

**G. Calgary is the business centre of the oil industry of the province.**

1. Why does it serve this function rather than Edmonton?
2. Although in a dry area, why does Calgary have plenty of water for all purposes?



**Edmonton.** Note suburban sprawl in background.

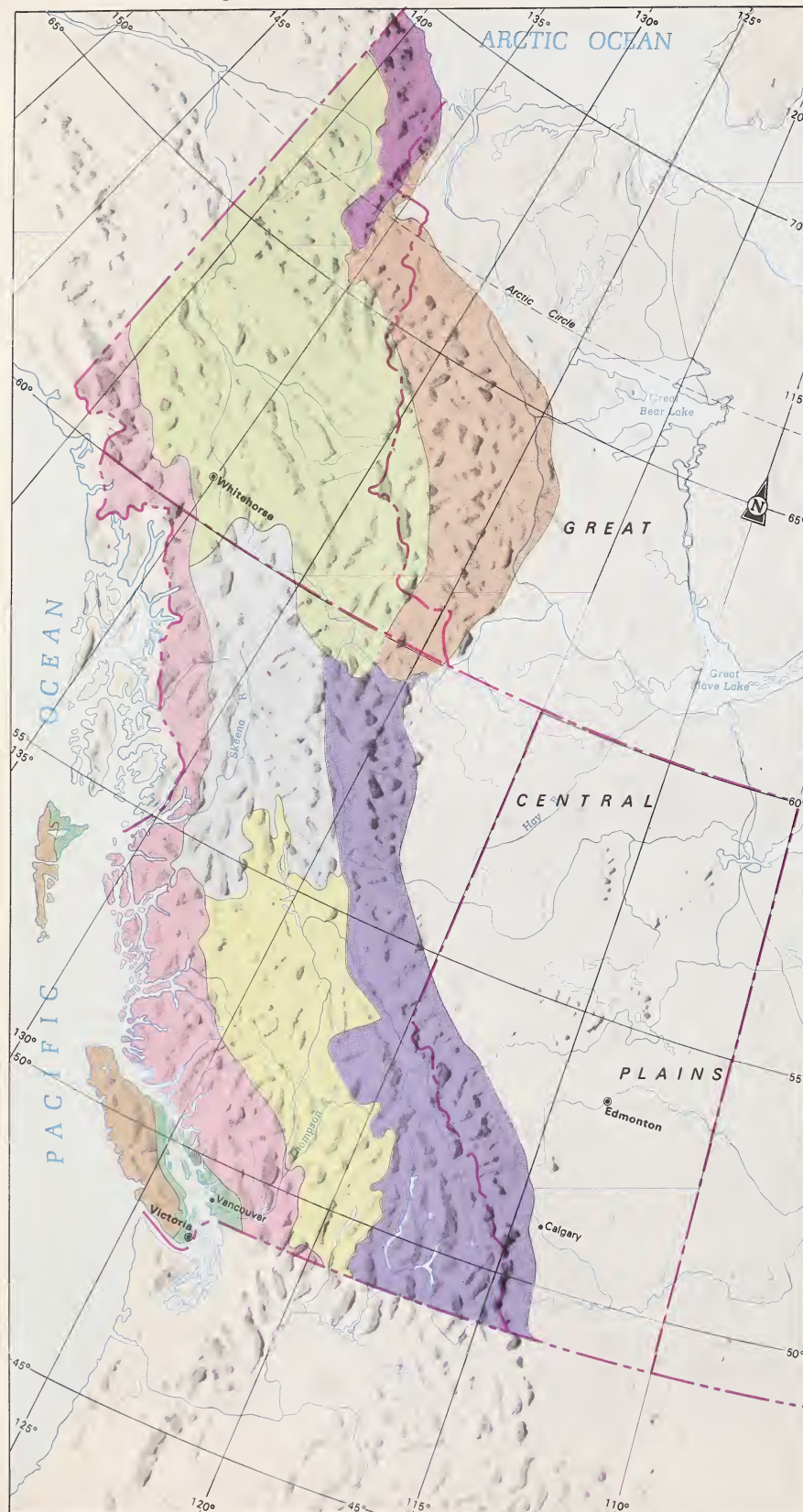


**Calgary** — What indications are evident that this is a centre of commerce?












## THE CORDILLERA REGION





## CORDILLERA EXTENT

### LEGEND

-  Arctic Mountain Area
-  Mackenzie Mountain Area
-  Northern Plateaus and Mountains
-  Central Plateaus and Mountains
-  Southern Interior Plateau
-  Coast Mountain Area
-  Coastal Trough
-  Outer Mountain Area
-  Rocky Mountain Area

0 100 200  
Miles

## EXTENT

A. The North American Cordillera extends along the west coast of North America from the tip of Alaska to the southern part of Central America.

1. What is the meaning of the term cordillera?

(a) Why is it a good one to apply to this area?

2. If the Cordillera begins at Lat. 70°N. in Alaska and ends at Lat. 10°N. in Central America, approximately how many miles, north to south, does it extend?

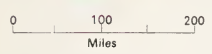
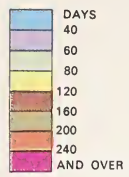
3. In what general direction do the mountain ranges and valleys run?

4. Define the following terms: trough, plateau, interior, ridge, and mountain chain.

5. What three types of landform make up the Cordillera Region?

6. How does the age, height, and appearance of the mountains in the Cordillera Region compare with those of the Laurentians and Appalachians?

**CORDILLERA  
FROST FREE PERIOD**



1. Because of their location and form, many advantages and disadvantages are derived from the Cordillera.

2. Comment on this statement, listing both the advantages and disadvantages of these mountains to man.

3. Name the political divisions of Canada through which the Cordillera passes.

a) Which of these has a coastline on the Pacific Ocean?

**CLIMATE**

MAP 77

1. Although farther north than the Great Lakes and St. Lawrence Lowlands, some parts of the Cordillera enjoy a much longer frost-free period.

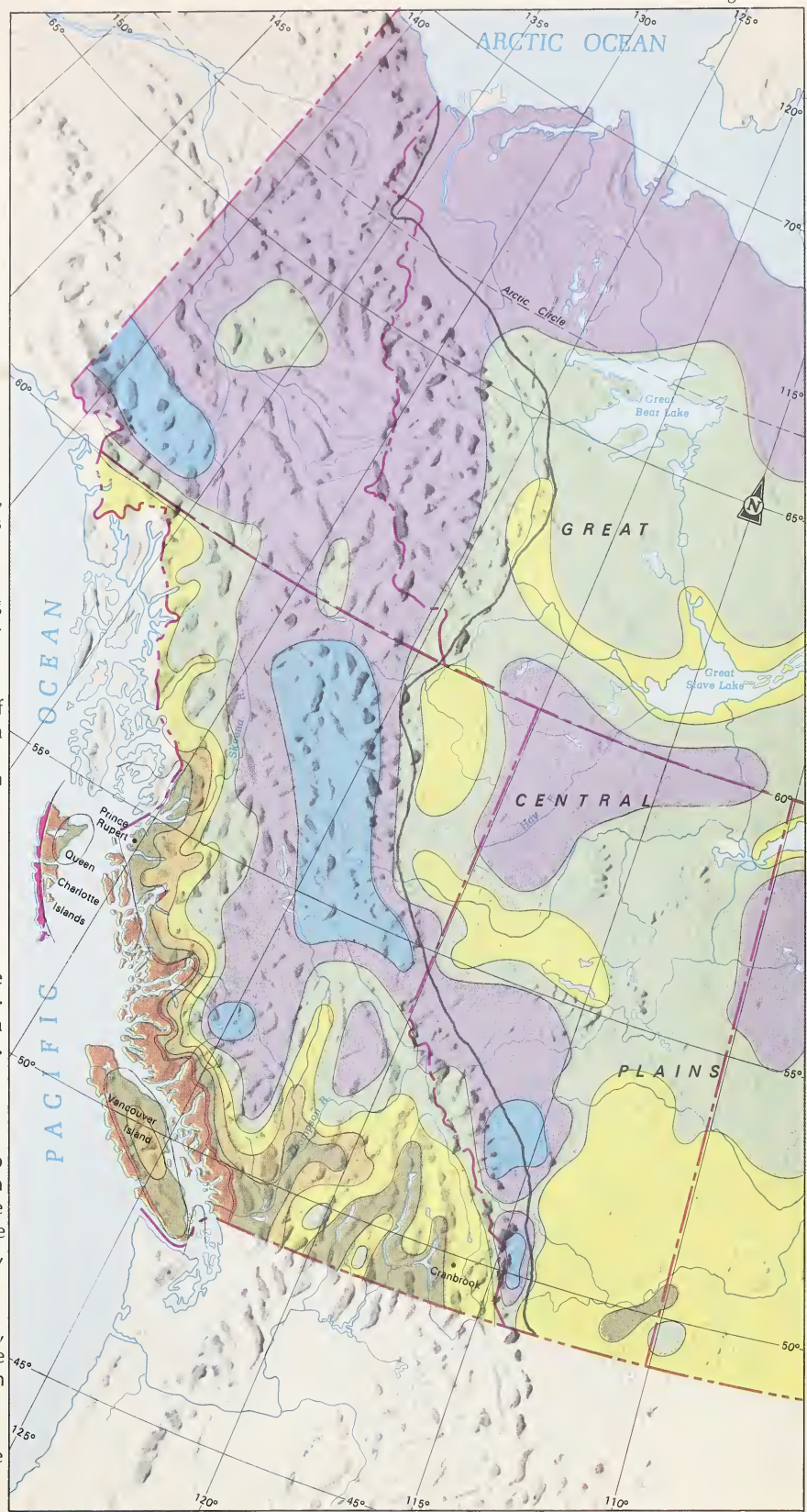
a) Why is this so?

2. Compare Map 77 with a relief map of the same area. How does the length of the frost-free period change as one travels: (a) towards the interior from the coast, (b) up the sides of mountains, and (c) northward along the coast?

3. Using your answers to question 2, where would you expect to find the greatest number of frost-free days in this Region? the least number?

4. Compare the map, Frost-Free Period, with Map 76.

a) Account for any similarities.

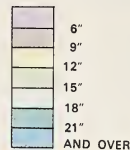


Map 77





# CORDILLERA RAINFALL DURING GROWING SEASON



0 100 200  
Miles

**B. Although farther north, the west coast of the Queen Charlotte Islands has a longer frost-free period than the west coast of Vancouver Island.**

1. Account for the long frost-free period along the coast.
2. In what direction along the Canadian coast do the warm currents from Japan flow?
3. What is the length of the frost-free period at Prince Rupert, and at Cranbrook?  
(a) Account for the difference.
4. What effect on the frost-free period has: (a) latitude, (b) altitude, and (c) nearness to large bodies of water?
5. In which areas of this Region would you expect to find the largest centres of population? Why?

## MAP 78

**C. The moisture that produces precipitation is carried to an area by wind.**

1. For what period does this map show the amount of precipitation?
2. How can you tell from the map that the prevailing winds are from the west?
3. What indication is there that the mountain ranges are parallel to the coast?
4. If the mountain ranges stretched in an east-west direction, how would the pattern of precipitation be affected?
5. Where do the westerlies pick up their moisture before reaching British Columbia?





Figure 53 — Douglas Fir, Height Comparison

**D. The Rocky Mountains are higher than the Coast Range.**

1. Why is there not heavy precipitation in the Rockies?
2. Account for the small amounts of precipitation at Kamloops and at Victoria.

**E. Winds from the north cross the Arctic Ocean and pass over Aklavik, which is near the coast.**

1. Why does Aklavik have so little rain?
2. Compare Map 77 with Map 78.
  - (a) Which would be the best area for agriculture?
  - (b) Which would be the worst?
  - (c) What types of vegetation would you expect to find on the slopes of the Coast Range?



Dense Forest in British Columbia



Scrub Timber in the Yukon





Map 79

## BRITISH COLUMBIA

(Refer also to Chapter 9 where British Columbia is used as an example for the study of map skills.)

**A. British Columbia is Canada's third largest province.**

### SURFACE FEATURES

1. Name the political area that borders British Columbia on the north, on the south, on the east, and on the northwest.
2. Which of these areas belongs to another country?
3. Where do you think that British Columbia's main market is located?
  - (a) Give reasons for your answer.

**B. British Columbia is isolated from the rest of Canada because of its many mountain chains.**

1. In what direction do the mountain chains run?
2. How would the mountains affect British Columbia's isolation if they ran from east to west?
3. What other Region is isolated in a like manner from the rest of Canada?
  - (a) Compare it with British Columbia.



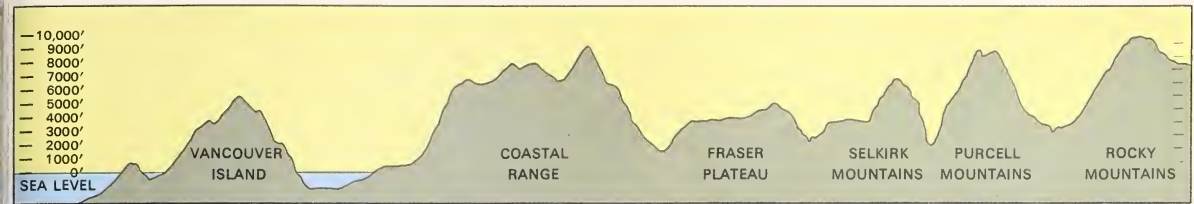


Figure 54 — Profile of the Cordillera

4. On a large outline map of British Columbia, mark the following areas:
  - a) Mountains—Insular, Coast-Cascade, Columbia (Cariboo, Monashee, Selkirk, Purcell), Rocky, Cassiar-Omineca, Skeena-Hazelton.
  - b) Plateaus—Fraser, Nechako, Nass Basin, Stikine.
  - c) Valleys—Coastal Trench, Lower Fraser, Okanagan, Selkirk, Purcell, Rocky Mountain Trench.
  - d) Plains—Tramontane.
5. To what physical Region does the Tramontane Plain belong?
6. Mark on your map four important mountain passes that connect British Columbia with Western Canada.
7. With the aid of the profile diagram, answer the following:
  - a) Which mountain range is the highest?
  - b) How high is it?
  - c) Find the height of the Coast-Cascade Range.
  - d) How many feet above sea level are the: (i) Okanagan Valley, (ii) Purcell Trench, and (iii) Rocky Mountain Trench?

(e) What is the altitude of the Insular Mountains?

(f) What conditions suitable for the development of hydro-electric power are found in British Columbia? Give reasons for your answer.

(g) Explain what is meant by the term vertical exaggeration. Why is it used in profile diagrams?



Fishing in the Fiords



Upper Alpine Terrain. Note the effects of glaciation.





Map 80

## FORESTS

**A. British Columbia's most important natural resource is its forests.**

**FROM THE TABLE ON PAGE 131**

1. How many thousand cubic feet of lumber were produced in this province in 1963?
2. About what proportion of Canada's total timber production was cut in British Columbia?
3. Make a "pie" graph to show the percentages of production for British Columbia and for the rest of Canada.

**B. The most important lumbering areas are in the rain forests along the coast.**

1. What proportion of the total lumber production of British Columbia is cut here?
2. Account for the dense stands of tall trees found in the forests of this area.
3. Name the most important kind of tree cut.



Patch Logging

C. Large parts of this province, in both mountain and valley areas, have forests unsuitable for cutting.

1. Give reasons why so much of the forest area cannot be used.

2. On a map of British Columbia, show the main saw-mill and pulp and paper towns.

a) Indicate the transportation routes serving these towns.

3. On another map of British Columbia, outline the main forest area and mark the principal species of tree found.

#### VOLUME OF WOOD CUT, BY PROVINCES, 1963

| Province or Territories         | M cu. ft.        |
|---------------------------------|------------------|
| Newfoundland                    | 89,027           |
| Prince Edward Island            | 6,045            |
| Nova Scotia                     | 84,176           |
| New Brunswick                   | 198,252          |
| Quebec                          | 913,542          |
| Ontario                         | 535,082          |
| Manitoba                        | 36,836           |
| Saskatchewan                    | 38,319           |
| Alberta                         | 133,472          |
| British Columbia                | 1,621,649        |
| Yukon and Northwest Territories | 3,965            |
| <b>TOTAL CANADA</b>             | <b>3,660,365</b> |





**Timber!!!**



**Loading**



**Dumping Logs**



**Port Alberni**

4. Match the description in column B with the species of tree in column A.

| A                  | B   |
|--------------------|---|
| (a) Douglas Fir    | — brittle wood used for pulp.                       |
| (b) Red Cedar      | — grows quickly in burned-over areas.               |
| (c) Hemlock        | — largest Canadian tree; lumber noted for strength. |
| (d) Sitka Spruce   | — light, used in construction of airplanes.         |
| (e) Ponderosa Pine | — used for roof shingles.                           |
| (f) Lodgepole Pine | — requires only 12-15 inches of rain a year.        |

5. Study the photograph of Port Alberni and tell:

- how the logs are kept together in the bay.
- how you know that the finished product is being exported.

(c) how you know that this town is located near the coast and not in the interior.

(d) what finished wood product comes from this mill.

6. Study the climatic graph (Figure 55).

- How do you know that the town is located near the coast?
- How long is the growing season of this area (number of days above 40°F.)?
- How many inches of precipitation does this area receive annually? How many during the growing season from March 1 to October 31?

**D. The tree in the photograph "Timber" is 200 feet high and 10 feet in diameter at its base.**

- Name this kind of tree.





Prince George in the Interior

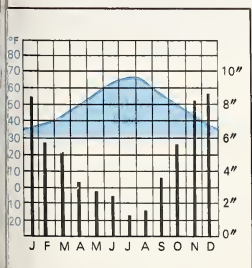


Figure 55 — Climatic Graph, Port Alberni

List some characteristics of its lumber that make it valuable.

What tool is used to cut down this type of tree?

**The big logs weigh thousands of pounds. The most common means of transporting logs to the waters of an inlet is by train or truck.**

Explain how they are loaded on to trucks.

2. Why aren't the logs floated down rivers to a mill?

3. How are the logs taken from the inlets to a mill?

**F. The largest sawmills are located along the coast at the mouths of rivers.**

1. Why is this a good location?

2. Name three different finished forest products manufactured in British Columbia.

**G. To conserve forest, "patch logging" is often used, as shown in the photograph on page 131.**

1. What is meant by the term patch logging?

2. How are the cut patches of land reseeded?

3. How do the remaining stands of timber help to prevent erosion?





Map 81

## FISHING

**A. Although British Columbia and Newfoundland catch nearly the same amount of fish every year, the value of the catch in British Columbia is much greater.**

1. What are the values of the fishery products of these two provinces?
2. Compare the price of Newfoundland cod with that of British Columbia salmon.
3. On a graph, compare the value of British Columbia's fishing industry with that of the rest of Canada.
4. Draw two maps of British Columbia and title the first Salmon, and the second Halibut and Herring.
  - (a) Use a suitable symbol to indicate the fishing areas for each kind of fish.

**B. As shown in the photograph, the coast of British Columbia has many fiords.**

1. What mountain range contains these fiords?
2. Why is the coast suitable for fishing and the establishment of fishing villages?
3. What other important industries connected with fishing are carried on in such centres as Prince Rupert, Vancouver, and New Westminster?

**C. Salmon, which spoils easily, is the most important catch on the Pacific Coast.**

1. Name the main methods of processing this species of fish.
2. What relation exists between the locations of Salmon plotted on your map, and the locations of fish processing plants shown on Map 81?
3. List other species of salmon, besides the sockeye, that are caught.



**Fjords.** Account for the settlement in the foreground.

After several years, the salmon returns from the ocean to spawn in the same part of the river in which it was born.

Define the word spawn.

What difficulties might the salmon encounter while swimming great distances up mountain rivers to their spawning grounds?

**Fish ladders have been built to help salmon pass large power dams.**

Explain how the fish ladders help the salmon in their upstream journey.

What happens to the fish after spawning?

**In recent years, the government of British Columbia has found that the salmon have greatly decreased in number.**

Account for the decrease.

What steps might you, as a government official, take to protect the salmon and to help increase their numbers?



Figure 56 — Value of Fishery Products by Provinces, 1961





Map 82

## WATER POWER AND MINING

**A. British Columbia's great water power potential is second to that of Quebec.**

1. Describe the conditions that provide this great potential.
2. Where do the following centres get their hydro-electric power: (a) Prince Rupert, (b) Kitimat, (c) Vancouver, (d) Trail, (e) Victoria, and (f) Penticton?
3. Name the area that provides oil and gas for the people of Vancouver.

4. Why do the oil and gas pipelines follow the course of rivers so closely?

5. Suggest reasons for the lack of greater development known mineral deposits in British Columbia.

**B. The chief metals found in British Columbia are lead and zinc.**

1. Name some uses for each of these metals.
2. Where is the world's largest lead-zinc mine?

**C. British Columbia produced \$34,647,000 worth of lead whereas the rest of Canada produced only \$19,166,000 worth. It produced \$51,485,000 worth of zinc, and the rest of Canada \$141,800,000 worth (1963-64 total).**

Make two graphs, one for lead and one for zinc.

(a) Compare British Columbia's production with that of the rest of Canada.





Map 83

In order to refine the ore from the Kimberley mines a great deal of electricity is needed.

Why is Trail's location suitable for the establishment of large smelters? (See map, Electric Power, and photo.)

Name the river on which this city is situated.

Why is the flat, fertile valley very important to the people in this area?

Where is the coal that is used in the smelters at Trail mined?

What form of transportation connects Trail with other important centres?



Mining in the Cordillera





Trail — Mining Smelter



Alcan Smelter

**E. The photograph shows an important feature of land surface that makes the Kitimat site ideal for building of a town.**

1. Name the feature.
2. Give at least two other reasons why Kitimat was selected as the site of an aluminium smelter.
3. Calculate the air distance from Vancouver to Kitimat.
4. List the raw materials required in the production of aluminium and locate the source area of each.
5. Where is the aluminium that is produced at Kitimat marketed?



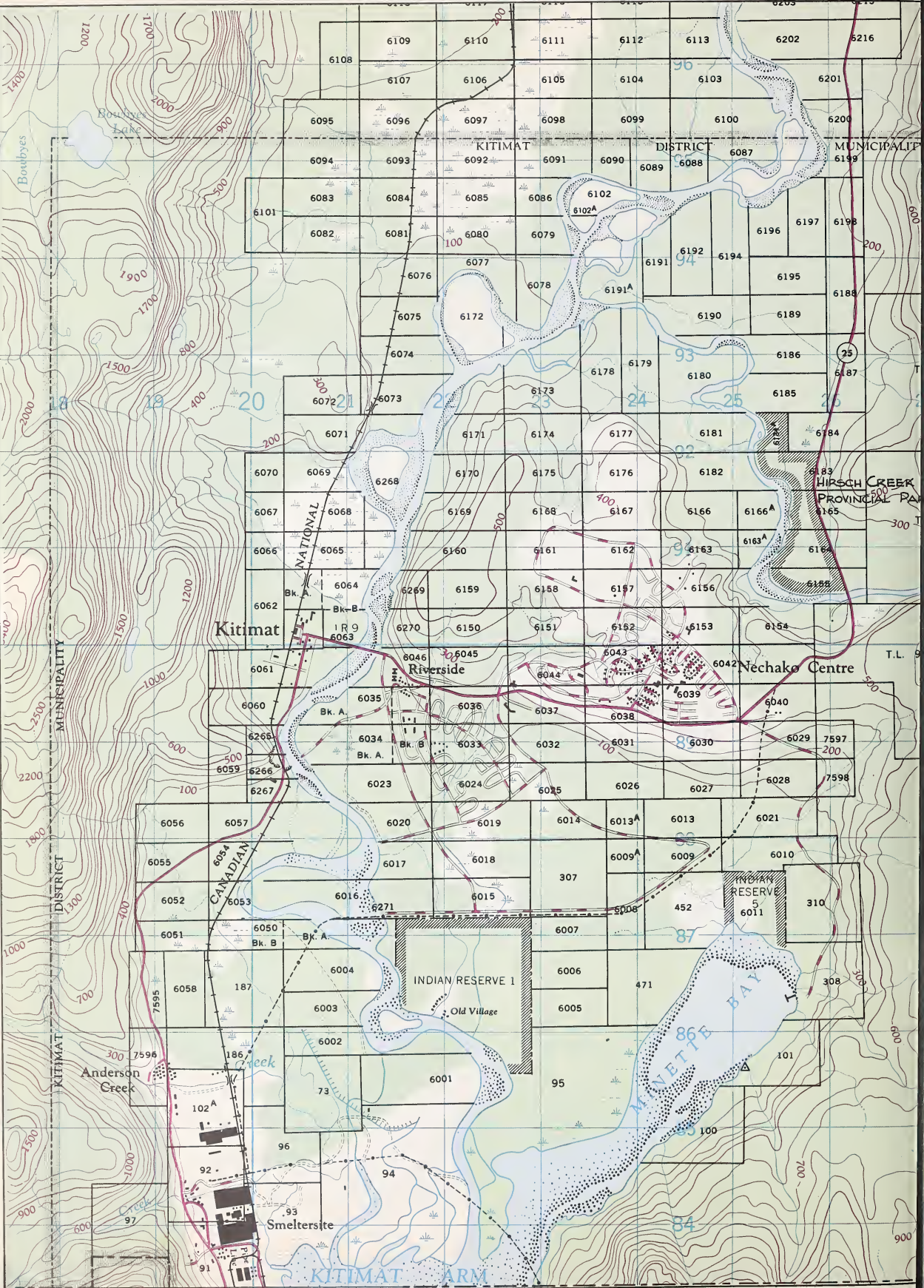


Figure 57 — Horizontal Scale, 1 inch to 15 miles

**F. The location of Kitimat was determined by the availability of abundant and cheap hydro-electric power.**

1. Name and locate the site of the hydro-electric generating station that provides electricity for the aluminium smelter at Kitimat.
2. How far is it from Kitimat?
3. Why was Kitimat not located at the generating station site?









## KITIMAT

The sites of the aluminium smelter and the residential areas are at different locations.

1. Locate the smelter. Name at least three things that indicate the land is flat and level.

a) Why is a water location essential for the site of this smelter?

b) At what elevation is the smelter located?

c) If  $1\frac{1}{4}$  inches on the map equal 1 mile, what is the highest elevation within a 2 mile radius of the smelter?

2. Account for the fact that the residential areas are located away from the smelter.

(a) Why is the route of the railway between Kitimat and the smelter different from that of the highway?

(b) Which of the four residential areas has the greatest elevation? How high is it?

(c) Which of the four has the largest population?

3. Compare the land features to the west of the smelter with the features to the east of it.

4. Locate a delta in the above photo.

5. Compare the land features to the west of the smelter with the appropriate contour lines in Map 84.





**Lower Fraser Valley.** Describe the Relief of the Farms.



**Fraser Plateau.** Note the Corral.

## FARMING

**A. Only a very small part of the land in British Columbia is under crop.**

1. Tell how each of the following affects farming in this province: (a) land surface, (b) climate, and (c) transportation.

2. On a map of British Columbia, use suitable symbols to locate and label the farming areas for: Dairying, Beef Cattle, Sheep, Wheat, Fruit, Mixed Farming, and Truck Crops.

**B. The lower Fraser Valley is one of the most important farming areas in this Region.**

1. What is the origin of the flat land shown in the photograph?

2. How long is the frost-free period in the lower Fraser Valley?

**C. In this area, there is much dairy farming, truck farming, and poultry farming.**

Why can perishable commodities be produced and sold successfully here?

**D. The Fraser Plateau is noted for its cattle and sheep ranches.**

1. What evidence is there that: (a) this is good cattle country, and (b) there is not enough rainfall for agriculture?

2. Why is agriculture difficult to carry on in this Region?

3. What are two important crops of this area?

**E. The interior valleys are very important farming areas.**

1. For what crop is the Okanagan Valley famous?

2. If the southern part of this valley receives only 7 inches of rainfall, how can crops be grown successfully?

3. Name some crops grown here.

4. What crops are grown farther north where there is sufficient rainfall but a cooler climate?

**F. The Nechako Plateau has several old lake bottoms that are suitable for farming.**

Give two reasons why old lake beds are generally suitable to agriculture.

**G. The main handicap in this area is the very short frost-free period.**

1. How long is it?

2. What is the chief cash crop grown by the farmers in this area?



**Okanagan Valley.** Identify the crop.



**Farming in the Valley.**



**Peace River Area.** What crop is grown in this area?





Vancouver Harbour

## VANCOUVER AND VICTORIA

**A. In 60 years, Vancouver has grown in population from a town of less than 1,000 to Canada's third largest city.**

1. What evidence is there that Vancouver is a busy seaport?
2. Why is its harbour one of the finest in the world?
3. Compare the seaports of Vancouver and Halifax, using the following headings: Water Temperature, Size, Population, Countries Served, Competition from Other Canadian Ports.
4. Which is the busier port?
5. Below is a list of commodities that you might see on the Vancouver docks. Tell whether each is being imported or exported, and tell where it probably came from:  
(a) unrefined sugar, (b) tea, (c) lumber, (d) rubber,

(e) fish products, (f) wheat, (g) coffee beans, and (h) pepper.

6. Why is winter a busy time for the export of wheat?  
(a) To what countries is it shipped?

**B. The main manufacturing area of British Columbia is in the Fraser delta.**

1. Name the cities located in this area.
2. Why is this a successful manufacturing area?  
(See page 41, Manufacturing.)
3. List the three most important industries of British Columbia in order of importance.
4. How have transportation routes and surface features helped Vancouver to become an important distributing centre?



What means of transportation connects Vancouver and Victoria?

Victoria is British Columbia's capital and its second largest city.

Compare its climate with that of Vancouver.

Account for any differences.

Why is the port of Victoria not as busy as that of Vancouver?

Why are visitors attracted to this city?

In which city, Vancouver or Victoria, would you probably live if you were: (a) a manufacturer, (b) a scholar, (c) a politician, or (d) a retired naval officer? Give reasons for your answers.



Canning Factory



Victoria Harbour





Vancouver



## THE NORTHLANDS



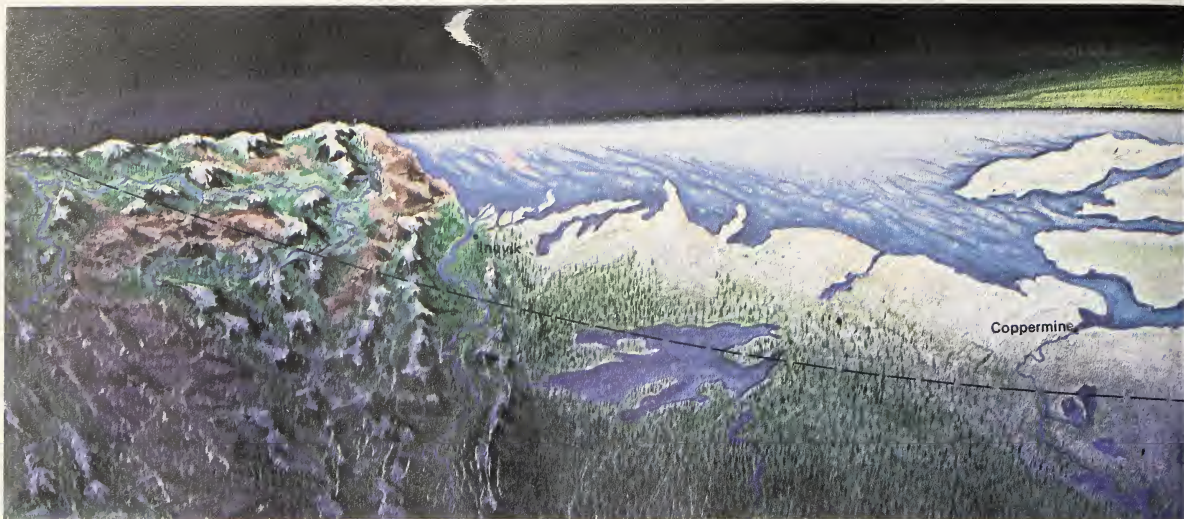


Figure 58 — Panoramic View of Land North of the Arctic Circle



Mountain Area



Forest Area

## DESCRIPTION

### A. MOUNTAIN AREA

**The world's most northern permanent settlement, Alert, is in the Canadian Northlands.**

1. On a map of the Northlands, shade the water blue and the Cordillera Region orange. Mark: (a) Aklavik, (b) Fort McPherson, (c) Dawson, (d) Keno Hill, (e) Whitehorse, and (f) Alert.

**The highest mountains in Canada are found in the Northlands.**

2. Name the highest peak, give its height, and mark it on your map.
3. State the chief occupation in the towns of this Region.
4. Why are the temperatures of the Cordillera Region higher than those of the Plains Region at the same latitude?
5. What physical features would an engineer have to follow when building roads through an area like this?

### B. FOREST AREA

1. On your map, shade the forest area green. Mark: (a) Mackenzie River, (b) Hay River, (c) Fort Providence, (d) Fort Smith, and (e) Norman Wells.

2. What have all these settlements in common?

3. Account for the fact that the trees in this area are not as large as those found along the coast of British Columbia.

**Although the Northlands have a very short growing season, there is some growth of vegetation.**

4. Explain the factors permitting growth.

5. Name one obvious occupation in this area suggested by the photograph.

### C. "LITTLE STICKS" AREA

1. On your map, shade the tundra-forest yellow and mark (a) Great Slave Lake, (b) Great Bear Lake, (c) Yellowknife and (d) Port Radium.

2. Why is "little sticks" a good name for the trees of this area?





"Little Sticks" Area



Tundra Area

3. Explain why the trees are smaller and fewer here than in the forests of Ontario or British Columbia.

4. Name the industry found in villages on Great Slave Lake.

a) Where is most of this product marketed?

b) What steps have been taken by the Canadian Government to protect this industry?

#### D. TUNDRA AREA

1. On your map, leave the tundra white and mark: (a) Inuvik, (b) Coppermine, (c) Resolute, (d) Eureka, (e) Alert, and (f) Frobisher Bay (settlement).

2. Explain the term tundra.

3. Describe the type of climate associated with tundra.

4. Define: (a) permafrost, (b) lichen, (c) Arctic Circle, and (d) permanent polar ice.

5. To what large physical region does most of this land belong?

6. From the photograph and your knowledge of this Region, describe the general appearance of the land.

7. What do you think might be the chief means of livelihood in this Region?

#### E. PANORAMIC VIEW

The artist's sketch shows a wide-angle view of the Northlands.

1. On your map, show with a dotted line, where the land shown in the southern part of the sketch might be.

2. About how many miles from east to west are shown?

3. Give the latitude of the area shown at the bottom of the sketch.

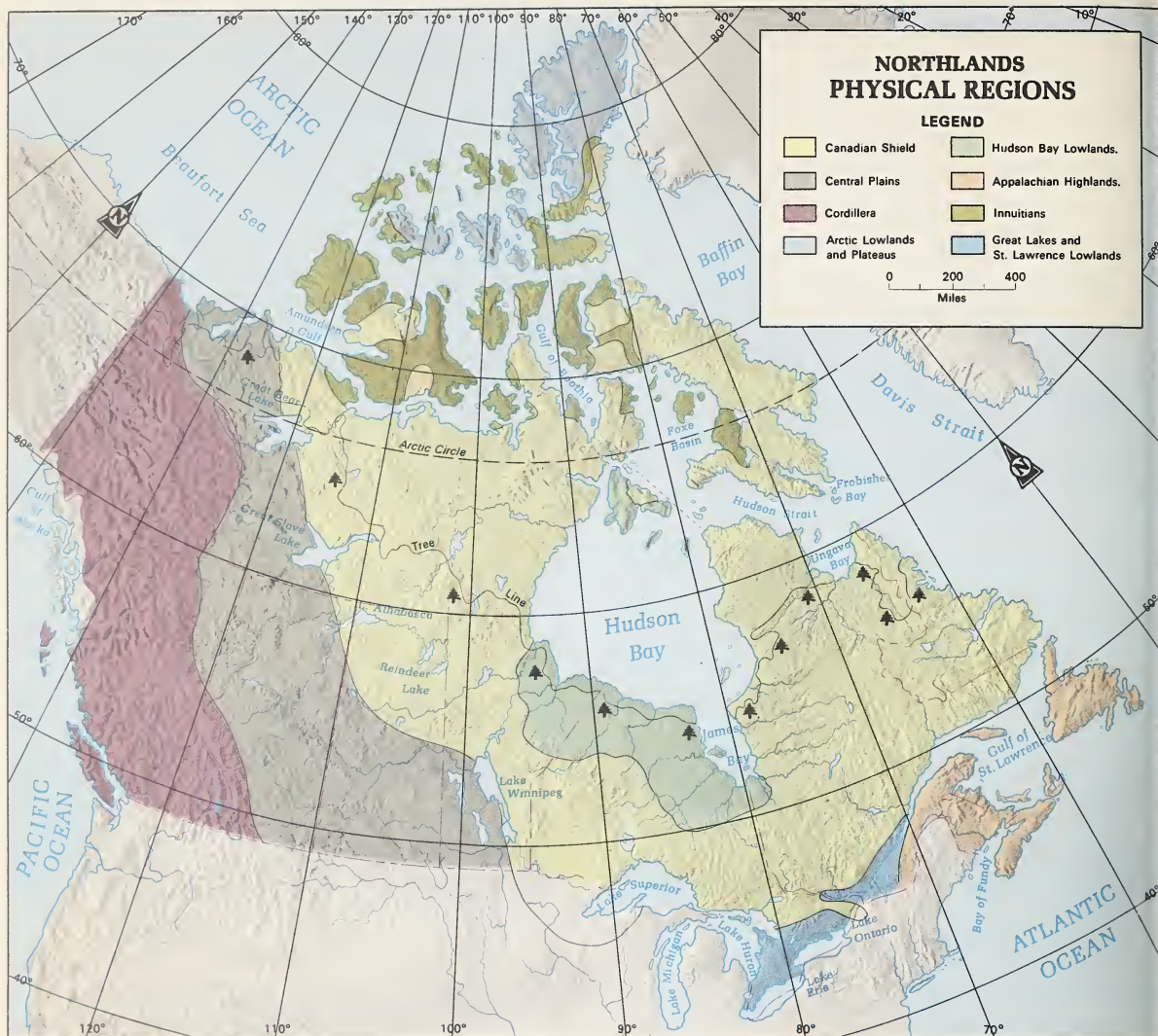
4. Describe the slope of the land as suggested by the sketch.

5. What direction is it: (a) from Coppermine towards the sun, (b) from Inuvik towards the sun, and (c) from Repulse Bay towards the sun?

6. Does the sun ever appear to be due north from where you live?

7. The position of the sun to the north, as drawn by the artist, suggests a time of day and a season of the year. What time and date are suggested? (A globe and a strong light may help to answer this question.)





Map 85

## EXTENT

A. Although the Northlands Region takes up more than a third of the total area of all Canada, very few people live there.

1. Match the beginnings in column A with the proper endings in column B.

A

- (a) The Northlands are located north of
- (b) The regions forming this area are
- (c) The total area contained is

B

- the Yukon Territory and the Northwest Territories.
- 40 percent of all Canada.
- Lat. 60°N.

(d) The territories making up this region are

— the west half of Canada.

(e) Most of the Northlands is situated in

— the Cordillera, the Great Plains, and the Canadian Shield.

2. On a map of the Canadian Northlands:

(a) Mark the territories and the three districts.

(b) Mark the following bodies of water: (i) Arctic Ocean, (ii) Beaufort Sea, (iii) Coronation Gulf, (iv) Foxe Basin, (v) Hudson Bay, (vi) James Bay, (vii) Hudson Strait, (viii) Davis Strait, and (ix) Baffin Bay.

(c) Colour with three suitable colours: (i) the Cordillera, (ii) the Great Plains, and (iii) the Canadian Shield.



(d) With the help of your atlas show, by a dotted line, the tree-line and the limit of permanent polar ice.

3. What do Alert, Halifax, and Vancouver have in common?

(a) What geometric figure would be made by joining these three centres by straight lines?

4. Calculate the distance, in miles, from Alert to Vancouver.

(a) What are the latitudes of these two places?

(b) If 1 degree of latitude covers about 69 miles, how far apart are these centres? Check this by using a scale of miles.

(c) If you took a journey of the same distance, southward from Windsor, where would you arrive?

5. What is the latitude of the Arctic Circle?

5. With the aid of a diagram showing the earth, the earth's tilt, and the sun, explain the long summer days and the long winter nights of the far north.

3. **Map 86 shows a view of the earth as it might be seen from a spaceship high above.**

1. Locate Alert on the map.

(a) How many miles is it from the North Pole?

2. What is the latitude of the North Pole?



Map 86—Polar Air Routes

3. What directions from the North Pole are Halifax, Vancouver, Russia, and England?

4. Identify the following: (a) Boundaries 1, 2, 3., (b) Countries 4, 5, 6., (c) Centres 7, 8, 9.

**C. The solid lines from Vancouver to London, and from Anchorage to Oslo, show airline routes between these cities.**

Why do these flights take polar routes?

### Inuvik, the Planned Community





## SETTLEMENTS

**A. The five largest Northland settlements are Whitehorse, Dawson, Fort Smith, Yellowknife, and Inuvik.**

Why is each of these places important?

**B. In such a cold climate, fuel for heat is most important.**

1. Name the most common fuel used.
2. What material is used to build houses such as those in the photograph on page 151?  
(a) Why is this material used?
3. Account for the absence of cellars in these houses.
4. What means of transportation is most widely used for travelling between these centres?
5. Why aren't other forms of transportation used?



Supplies from the Outside World

## SUPPLY SHIP

The biggest event of the year at northern posts is the annual visit of the supply ship.

1. At what time of year was the picture taken?
2. How often do supply ships visit these settlements?
3. What effect does the long distance from the manufacturer have on the price of goods?
4. Why aren't the goods taken in by airplane?
5. How does the picture tell you that the weather is cold?
6. What other means of transport are important to this area?

## TRADING POST

**Many Eskimos and Indian trappers do not use money**

1. What method do they use for obtaining goods?
2. If you were an Eskimo hunter what goods might you select at the trading post?
3. What pelts might you use for exchanging at the trading post?
4. Judging from the goods you see at the post, how has the white man influenced the life of the Eskimo and the Indian?



Whale Meat for the Community

## FISHING

Fishing and hunting are very important to the people of this area.

1. Name the most important fish and wildlife caught in this area.
2. How are fish and wildlife used by the Eskimo?
3. What large lake supplies tons of commercial fish every year?  
(a) Why is this a growing industry?



Trading Post



Limited Agriculture

## AGRICULTURE

**A.** Although the frost-free season in this area is short, some agriculture is carried on.

In what parts of the Northlands are vegetables grown?

(a) How is this possible?

**B.** Very little rain falls in this area.

Why does this not pose a problem?



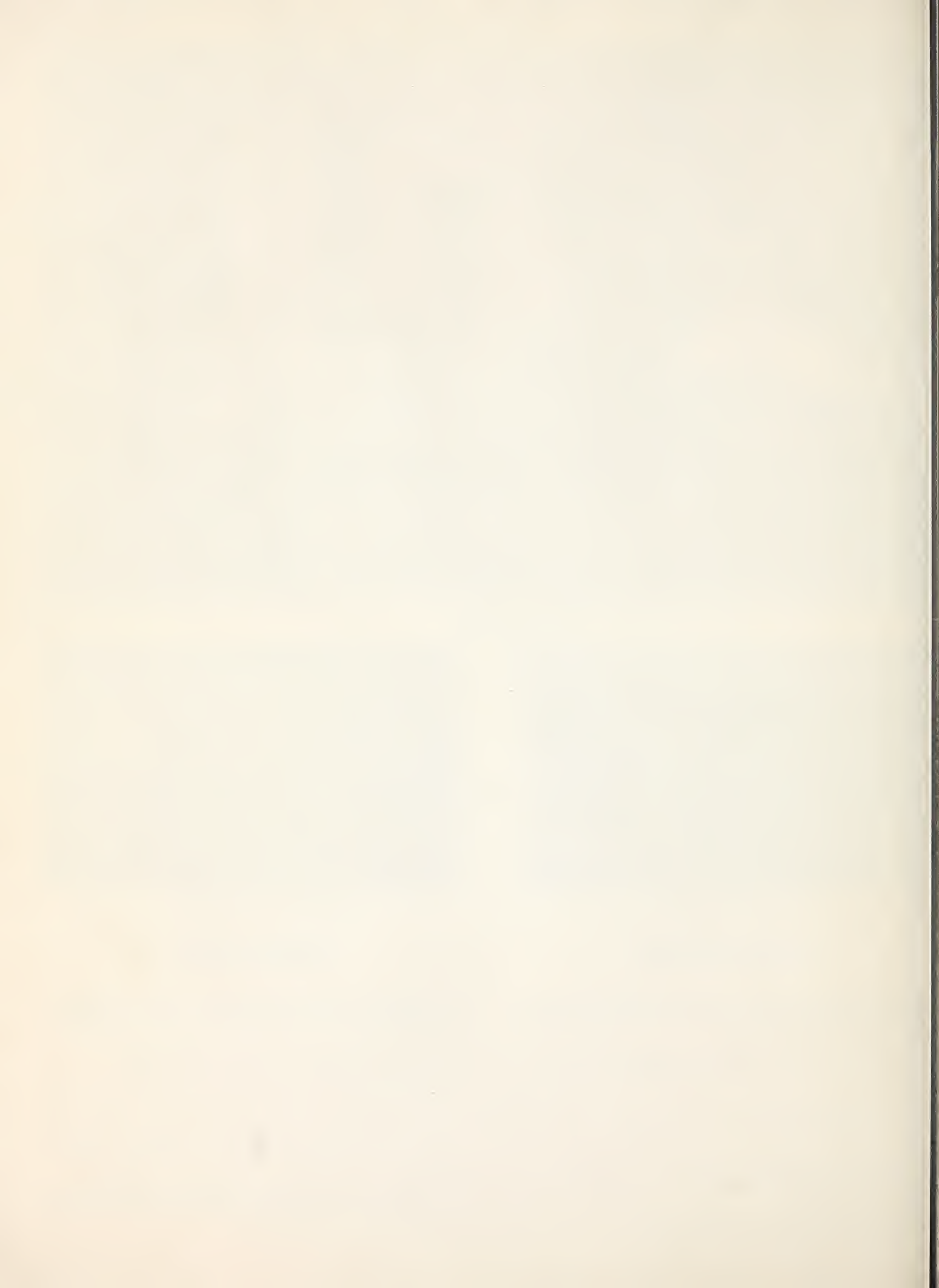
Reindeer Roam the North

## HERDING

In 1930, the Canadian Government bought 3,000 reindeer. Within five years the herd doubled in size.

1. Why is the reindeer important to the Eskimo?
2. In what part or parts of the Northlands do the herds graze?
3. How might herds such as this help to create new settlements?
4. Where did the Canadian Government obtain these reindeer?

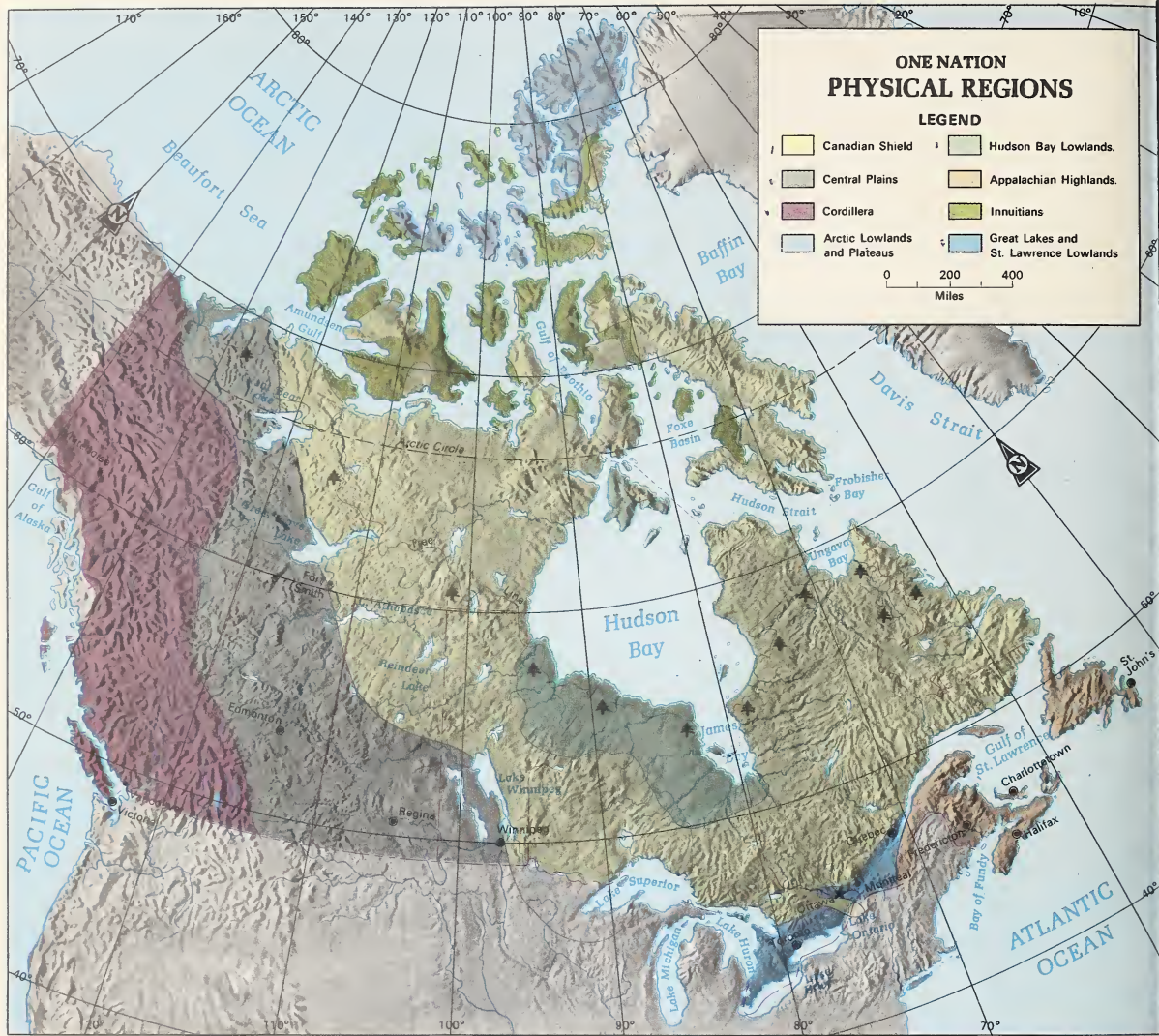






## ONE NATION





Map 87

## PHYSICAL REGIONS

**A. One of the factors that has hindered the development of Canada has been the physical characteristics of its different parts.**

1. Describe the surface features of each physical Region.
2. What difficulties are encountered by man in each of these Regions?
3. Outline the effect that each Region has had upon the development of Canada.
4. How have the characteristics of the Region helped

man in: (a) mining in the Shield, (b) building railways across the Plains, (c) lumbering on the west coast, (d) farming in the Lowlands, and (e) touring in the Appalachians?

5. What proportion of Canada is occupied by the Shield?  
(a) How many square miles is this?
6. What is the size of the smallest Region?

**B. Water is essential to man and all living things.**

Name two important ways that water, or the lack of it, affects the life of man in each of the physical Regions.

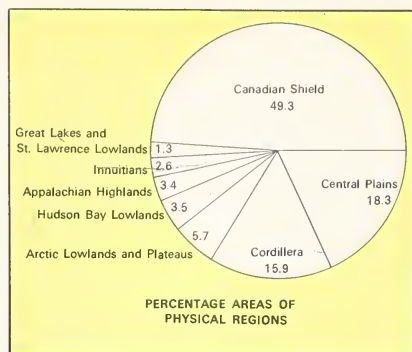
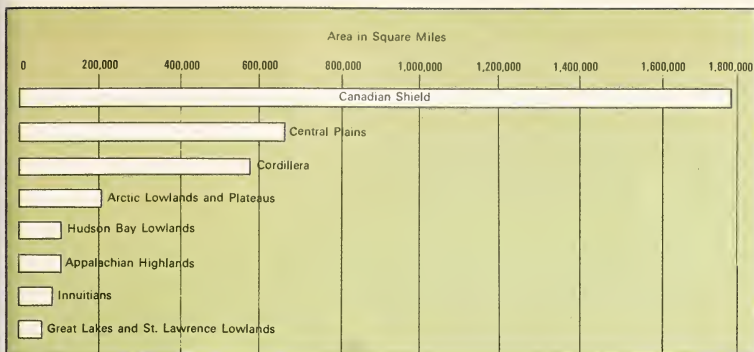


Figure 59 — Canada's Area by Physical Regions



## FARMLAND

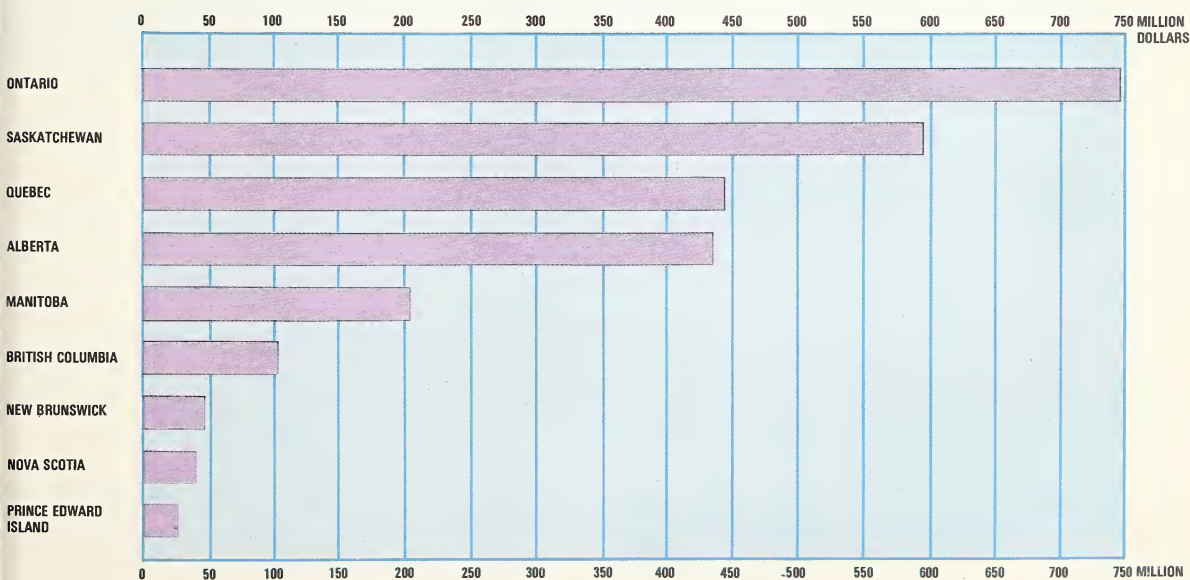


Figure 60 — Farm Income by Provinces





Map 88

**A. Of the total land in Canada, only a very small part is farmed.**

1. Give at least three reasons for this.
2. In which physical region is there extensive farming?
3. Why do farming areas often lie along river valleys?
4. Why are the farms in the Atlantic Provinces situated along the coast rather than inland?

**B. Although Ontario and Quebec have much less farmland than the Prairie Provinces, their farm incomes rank first and third.**

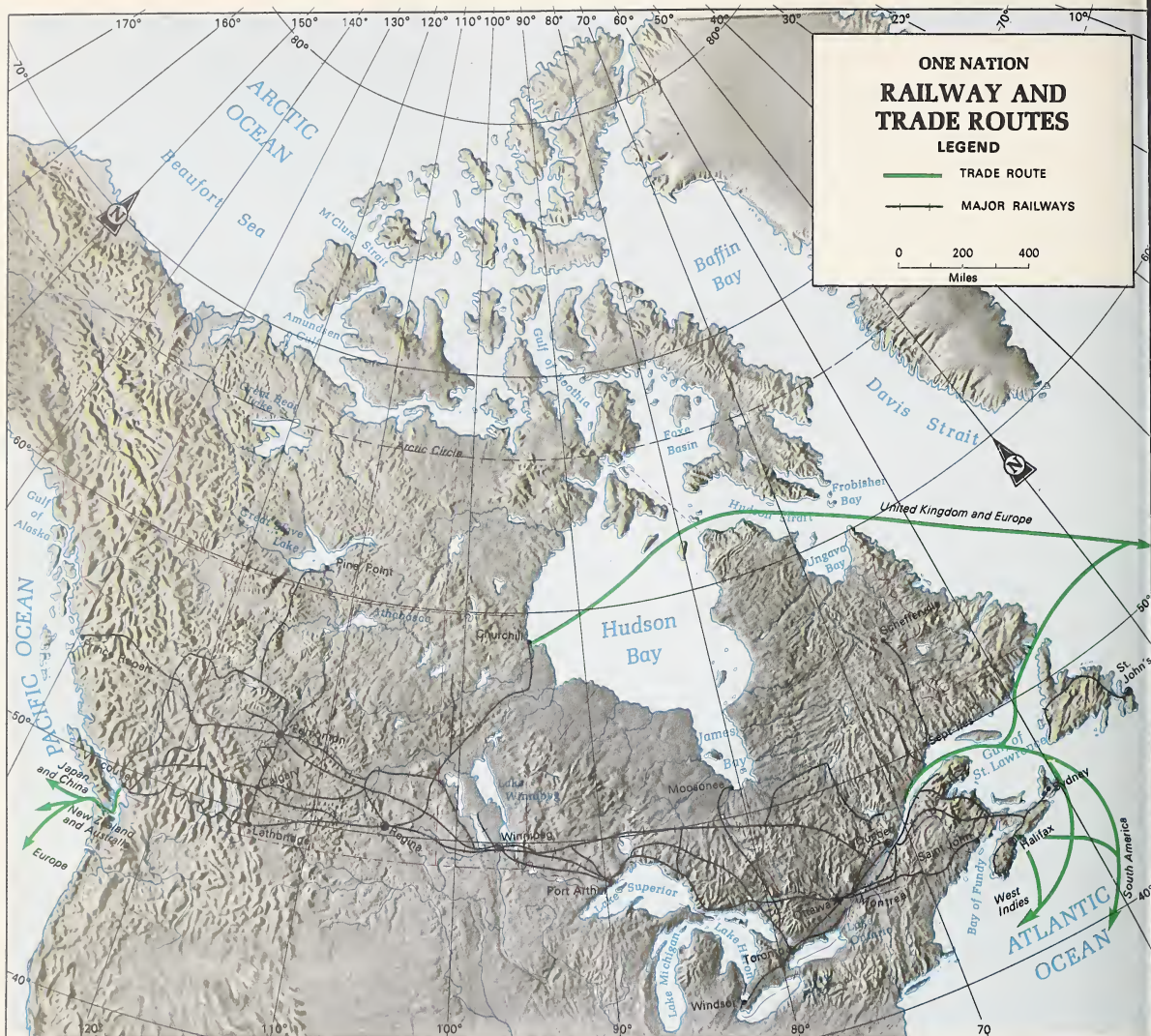
1. Account for this fact.
2. Which province is not listed on the chart?
  - (a) Why is this so?
3. Why is farm income so low for Prince Edward Island, even though most of the land is under cultivation?
4. If you were a farmer coming to Canada, where would you settle to: (a) grow fruit, (b) grow grain, (c) grow potatoes, (d) produce maple syrup, (e) engage in dairying, and (f) raise livestock?



## POPULATION

5. How does climate affect farming and settlement?





Map 90

## TRAVEL AND TRANSPORT

**A.** Several factors have worked against Canada's becoming a nation.

Tell how each of the following has hindered the country's development: (a) size and distance, (b) land surfaces, (c) small population, and (d) geographic location.

**B.** By wagon, it once took a year or perhaps two years, to travel from Toronto to Vancouver and back.

1. Why did the promise of a railway prompt British Columbia to join Canada?

2. Outline the routes taken by the railway in helping:

(a) the Prairies export wheat, (b) British Columbia import cars, (c) the Shield export newsprint, (d) the Lowlands import cattle, and (e) the Atlantic Provinces export fish.

3. What Canadian cities have become important railway centres?

4. Consider the effect that the building of railway lines in the Northlands should have on the development of the region.

5. Name Canada's chief agricultural export.

(a) Which countries are its most important buyers?

(b) Through which ports is it exported?



6. What country buys most of Canada's newspaper?
7. Name three other important Canadian exports and the countries that buy them.

**C. Nearly three-quarters of Canada's trade is with the United States and Britain.**

1. Describe the route by which cases of salmon are shipped from Vancouver to London.
2. If wheat is shipped from Winnipeg to Europe during the winter months, through what Canadian port does it pass?

**D. The distance from Halifax to Vancouver is approximately 3,600 miles.**

1. Compare the advantages and disadvantages of travelling this distance by: (a) car, (b) train, and (c) airplane.

2. Plot a car trip along the Trans-Canada Highway between Halifax and Vancouver.

(a) Mark the daily distance travelled if you averaged 400 miles per day.

(b) Describe the land surfaces you would have seen during each day's journey.

(c) During which days would you be able to travel the 400 miles the fastest? the slowest?

3. Which part of Canada: (a) would you like to visit most? (b) would you like to visit least?

(a) Explain why for each of your answers.

4. If you were Prime Minister of Canada, what would you consider to be Canada's most pressing problem, and how would you attempt to solve it?





# CLIMATE

**A. Climate has a very great influence on where people settle.**

1. What are the two main factors that determine climate?
2. How does climate determine the size of population in: (a) the Northlands, (b) the Lowlands, and (c) the Plains?

**B. Although Toronto is inland from the sea, its winters are not severe.**

1. Why is this so?
2. Account for the small amount of precipitation in Winnipeg.

3. Give two reasons why the winters in Winnipeg are colder than those in Toronto.

4. Compare the winter temperatures: (a) at Vancouver with those at Winnipeg, and (b) at Frobisher Bay, with those at Vancouver.

(a) Account for any differences.

5. In which climatic region: (a) does the least precipitation occur? (Explain why.), (b) can you wear the lightest winter clothes?, and (c) do you find an adequate, even amount of precipitation all year?

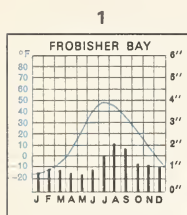


Figure 61

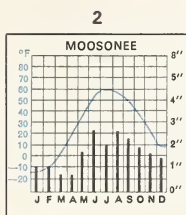


Figure 62

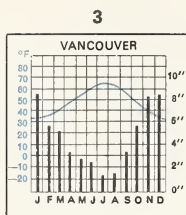


Figure 63

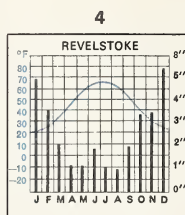


Figure 64

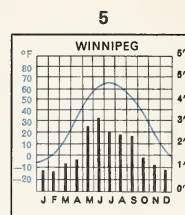


Figure 65

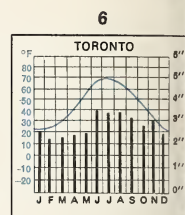


Figure 66

## Climatic Graphs



## WORKING WITH MAPS





Photographs provide general impressions.



Sketches focus attention on specifics.



# VISUALS

## PHOTOGRAPH

**A. A photograph of an area provides a general impression.**

1. From the photograph, suggest one important industry that might be found in this area.
2. What does the vegetation suggest about the rainfall in this area?

**B. The information in a photograph is often limited. For example:**

1. Where was this photograph taken?
2. What is the population of the city?
3. How far is it from Bridge A to Bridge B?
4. At what height must an airplane fly to clear the tops of the mountains?

## SKETCH

**C. A sketch, through colour and the omission of unnecessary detail, focuses attention on specific information.**

1. Locate the railway on the sketch. Find it in the photograph.

2. Name three important industries suggested by the sketch.

3. What two means of public transportation for crossing the river are evident?

4. Name four types of boats visible in the sketch.

## MAP

**D. A map, as a symbolic representation of an area, can provide the greatest accuracy and the most detail.**

1. What indicates that this is part of the northern hemisphere?

2. Name the city.

3. Which direction on the map is north?

4. Name the main body of water.

5. How far is it from the First Narrows to the Second Narrows?

6. At what height must an airplane fly to clear the mountains?

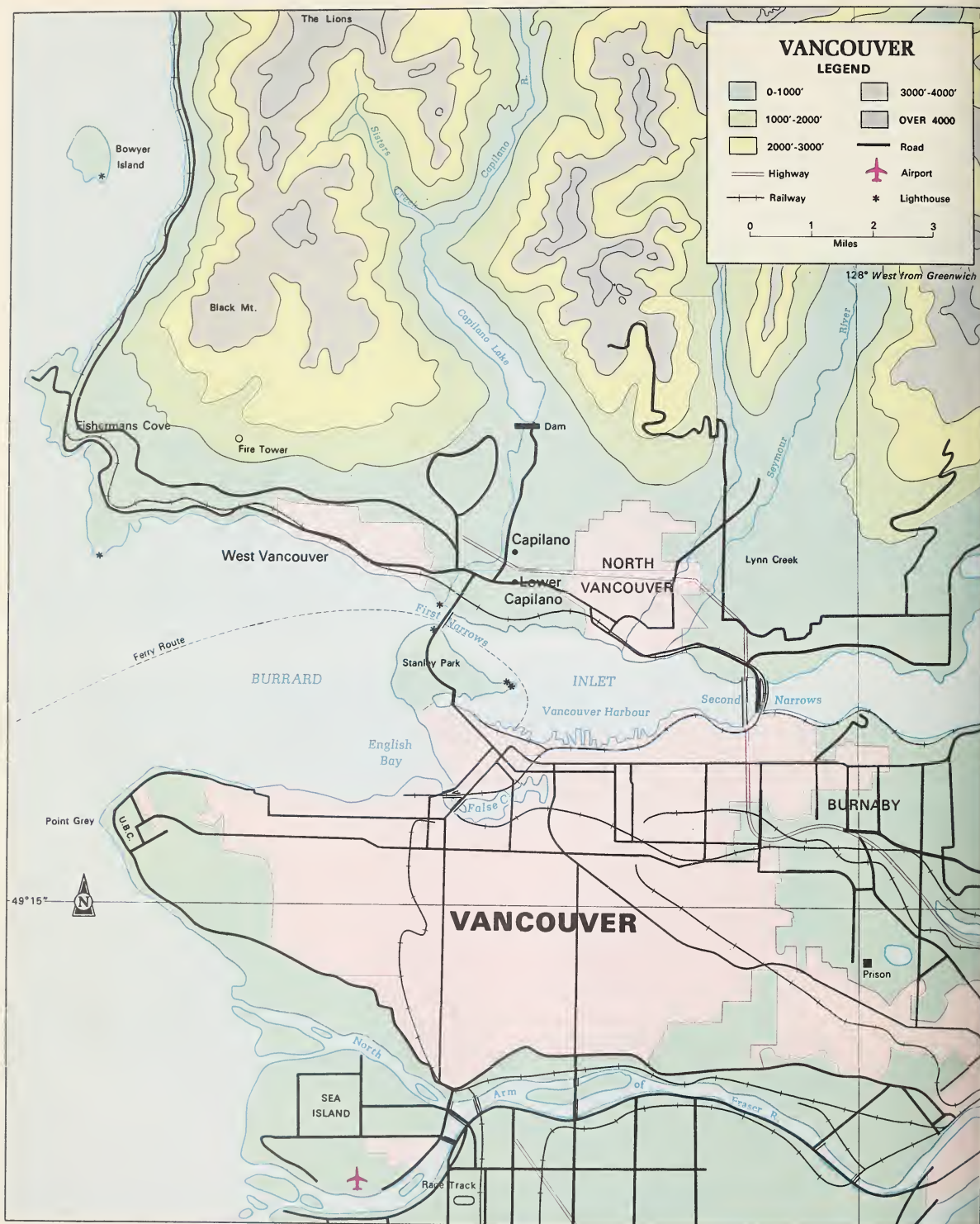
7. Give reasons why this harbour is one of the best in the world.



Map 92

Maps can provide the greatest accuracy and the most detail.





Map 93

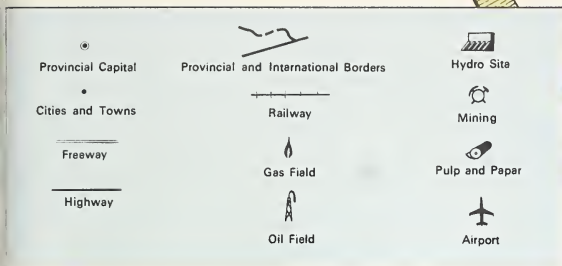
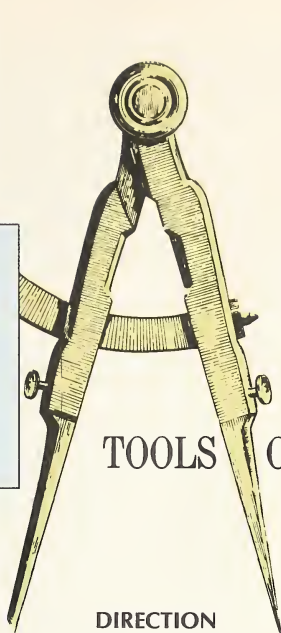


Figure 67 — A Typical Map Legend



## TOOLS OF MAP READING

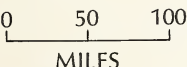
### LEGEND

**A. The legend is the glossary of a map and explains the meaning of the symbols used.**

1. How are the various heights of land indicated?
2. Draw the symbol for a bridge.
3. Locate the following on the map: railway, main highway, pulp and paper mill, mine, hydro-electric power station, and airport.

### SCALE

**B. Scale represents the unit of distance on a map that stands for an actual distance on the earth's surface. Scale can be shown in various ways:**

As a fraction,  $\frac{1}{10,000}$   
 As a ratio, 1:10,000  
 As a graph,   
 MILES

The fraction and ratio methods indicate that 1 unit of measurement on the map represents 1,000 units on the earth. The graph method indicates that 1 inch on the map represents 100 miles on the earth.

1. What scale is used on Map 93?
2. How far is it from the First Narrows to the Second Narrows by water?
3. Using a string or dividers, calculate the distance, by car, from the main harbour to the University of British Columbia.
4. Is it shorter to go by car or by water from the Second Narrows to Point Grey?

### DIRECTION

**C. Direction on a map may be shown by a direction symbol or by grid lines.**

1. Draw a 16-pointed compass and name the points.
2. What direction is Point Atkinson from False Creek?
3. What direction is Dollarton from Vancouver International Airport?
4. In what direction must a captain steer his ship from Prospect Point to Point Atkinson?
5. In what direction was the photographer facing when the picture was taken?

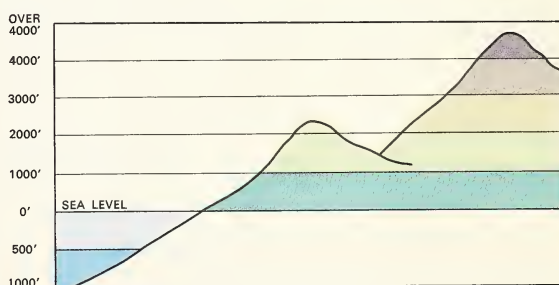


Figure 68 — Profile Diagram

### ELEVATION

**D. Colour serves many purposes on a map. In this instance it is used to indicate the height of land above sea level.**

1. What heights are indicated by the various colours?
2. How high above sea level are The Lions?





Map 94

## TYPES OF MAPS

Maps can provide many kinds of information.

### RELIEF

1. From the legend:

- How is the height of land indicated on the map?
- Into how many levels is the land divided?
- What heights are represented by the colours at each level?

2. From the map:

- What are the elevations at: (i) Vancouver, (ii) Penticton,

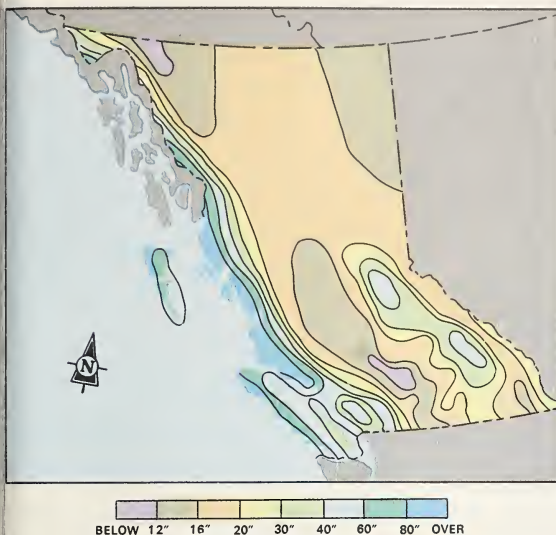
and (iii) Dawson Creek?

- Compare the steepness of the coast at Prince Rupert with that at Victoria.

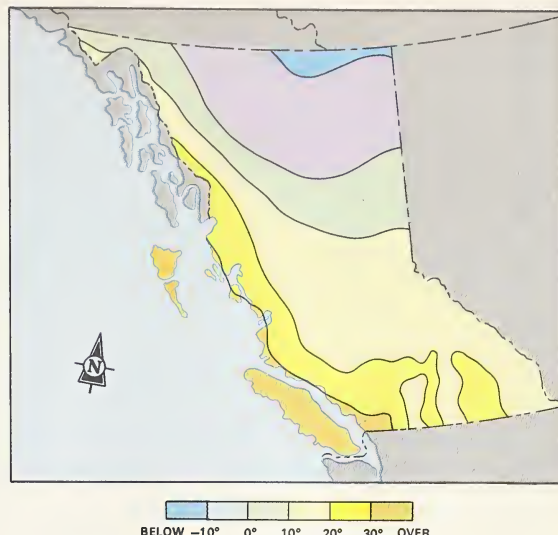
(c) Comment generally about the height of land in British Columbia.

- At what level is the Fraser River: (i) at its source, (ii) at Prince George, and (iii) at Vancouver?

(e) What is significant about the direction of flow of the Fraser River?



Map 95—Annual Precipitation



Map 96—Average January Temperature (°F)

## PRECIPITATION

1. From the legend:

- Why are the colours used to indicate precipitation appropriate?
- What unit is used to measure precipitation?
- How many inches of precipitation are represented by each colour?

2. From the map:

- What is the annual precipitation at: (i) Victoria, (ii) Trail, and (iii) Prince George?
- Which area of British Columbia has: (i) the greatest amount of precipitation, (ii) the least amount?
- Use Maps 94 and 95 and your knowledge of winds and the water cycle to explain the heavy precipitation along the coast, and the lighter precipitation at Prince George.

## TEMPERATURE

1. From the legend:

- What unit is used to measure temperature?
- How many degrees of temperature does each colour represent?

2. From the map:

- What are the average January temperatures at: (i) Victoria, (ii) Prince George, (iii) Trail, and (iv) Prince Rupert?

- What influence has the ocean on temperatures along the coast?

3. Using Maps 94 and 95:

- Give two reasons for January temperatures being lower at Trail than at Victoria.
- Why is the north coast colder than the south coast?
- Name three factors that cause low temperatures.
- Where in British Columbia would you expect to find the lowest temperature?





Map 97

### WATER FEATURES

1. What bodies of water separate Vancouver Island from the mainland?
2. Name the river that empties into the ocean at the city of Vancouver.
3. Where are most of the cities in British Columbia situated?
4. What is the best means of surface transportation from Vancouver to Prince Rupert?  
(a) Explain your choice.
5. What use has man made of the water resources in this area?
6. Why are there so many hydro-electric power sites in this province?  
(a) What industries would use this power?

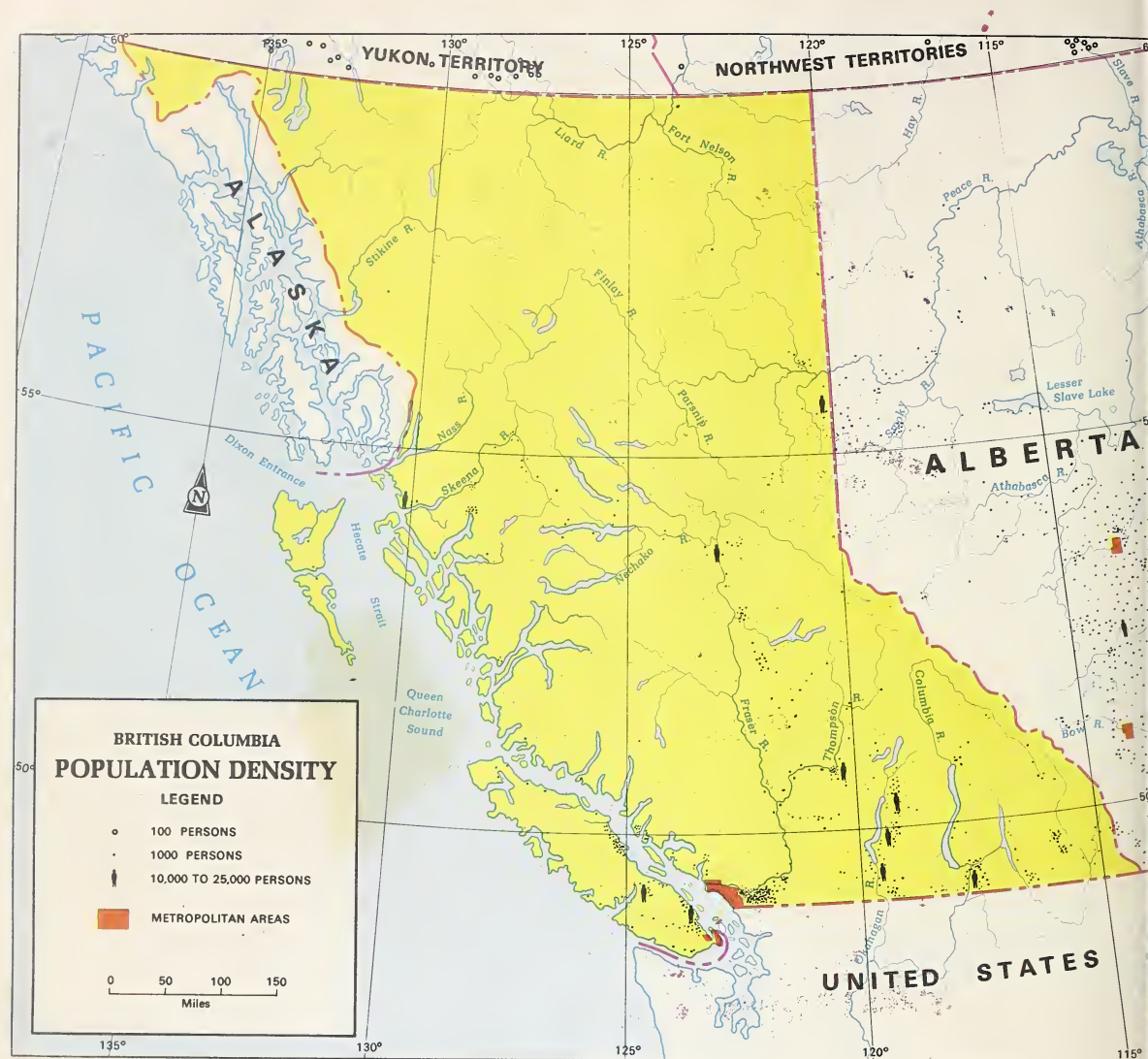


Map 98

## TRANSPORTATION

1. From the legend:
  - (a) Identify the means of transportation shown on the map.
  - (b) What symbol is used for a major airport?
  - (c) How does the symbol for the provincial capital differ from the symbol for other cities?
2. From the map:
  - (a) Why are there so few major roads in this province?
  - (b) Why do so many of the highways run parallel to rivers?
  - (c) Using the scale of miles and a pair of dividers, calculate how long it would take a ship, travelling 25 miles an hour, to make the trip from Vancouver to Prince Rupert? How long would it take a train, travelling 40 miles an hour, to make the same trip?





Map 99

## POPULATION

1. From the legend:

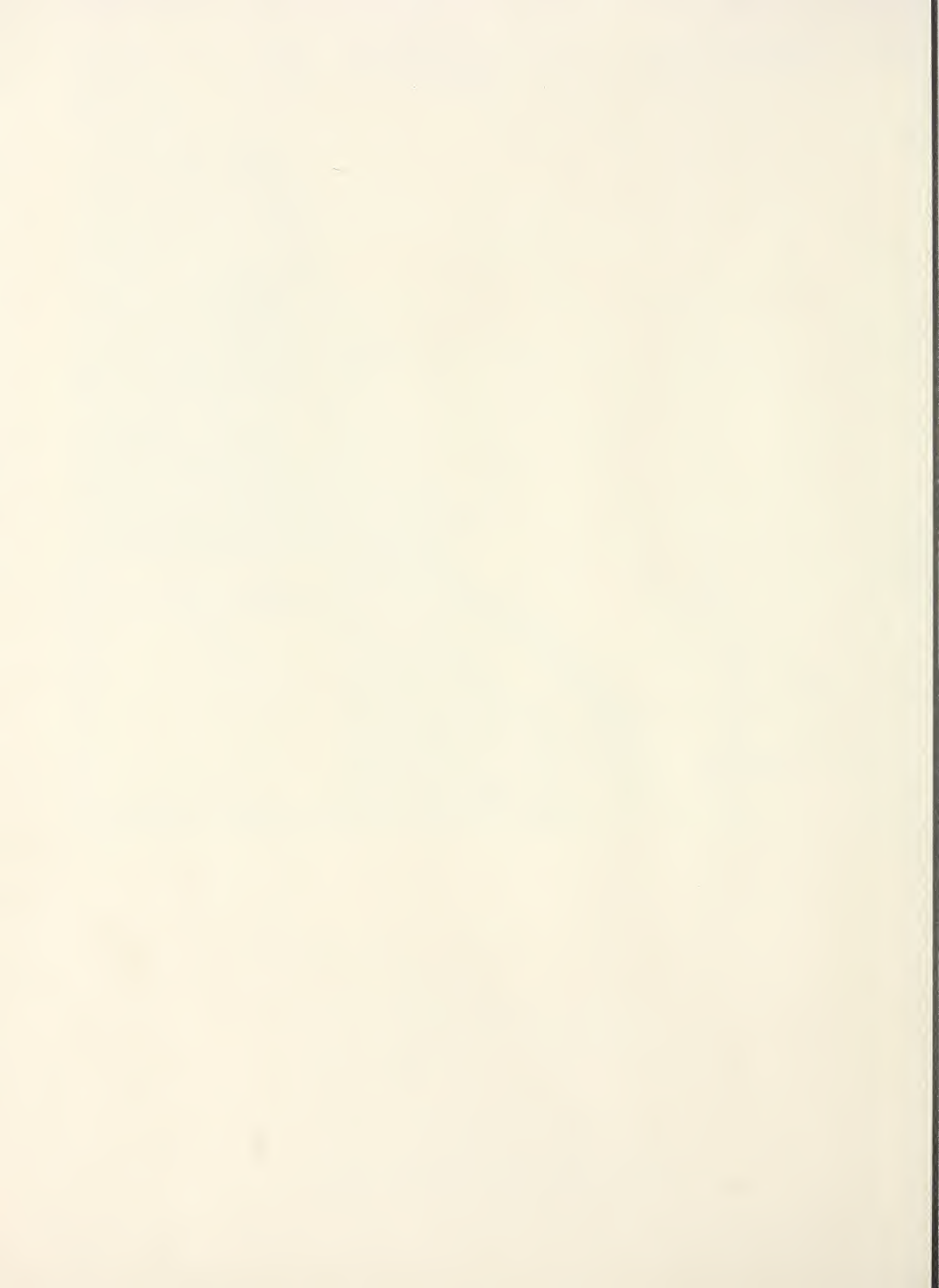
- (a) What unit is used to measure population?
- (b) How many people are represented by: (i) each dot and (ii) a circle?

2. From the map:

- (a) Where do the majority of the people live?
- (b) What connection is there between settlement and river valleys? Name two of the largest settlements.
- (c) Why is much of this province uninhabited?











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